*The history and sociology of computer science and technology. A
historiography and source material.*

Camille Akmut

The History of Computer Science and Technology

Reflection of a reflection : a (peer) review.

Camille Akmut

Abstract

This review article – a reflection of a reflection – concludes our series of studies on the social conditions of computer science and technology. (One further article, currently still being written, will appear.) It is given here in the hopes that it will create a thousand more new researchers on these many, varied problems, questions – all of which open. (Originally “A hundred references to create a thousand more researchers”, we fear we may not have been able to achieve that goal – but all the same.) Peer review, but not in the intended sense however : for, there are us too..

To Jean Cavailles (1903-1944)

“A philosopher-mathematician loaded with explosives, a tenacious realist, resolute without optimism. If that is not a hero, what is?” (Canguilhem)

Primary sources (read explicitly : open questions and problems)

We must “muddle” with our times, and what(ever) they bring. If one wishes to do anything original in this century. False notions : “proper” research (for proper people), “real” sources (for sometimes unreal people), or “proper” methodologies (for not-always-so proper gentlemen and gentlewomen of scholarly concerns, and too often priorities), and all the rest of things that are so many shackles to all of us, including those who put them on others in their real false beliefs. Others may and will continue to conceive of their offices as places of undisturbed leisurely activities, the retreat of the pure mind, paid reading and recreational writing rooms in so many words, only disturbed by the hours of noon and four – lunch with the colleagues, boy-oh-boy do they love lunch with the colleagues, where many things are heard, and better not repeated for their sake, if only lunch could make up their whole day, a task they sometimes even manage by an arithmetic whose mysteries only our historians of science will be able to tell – the bottom is bottomless.

Writings by computer scientists

1. <http://ai.eecs.umich.edu/people/conway/conway.html>

Description The writings of Lynn Conway (1938-) : pioneer of VLSI (Very large-scale integration) architecture. (Fired by IBM – a company that now practices diversity with a capital letter – because she was a transgender woman.*)

*who, by some miracle, had escaped the fate of almost all of the other transgender women of her times : and, that is – our proper readers will pardon us, the rest already know – street or brothel prostitution.

2. <http://www.aaronsw.com/weblog/fullarchive>

Description “Full archives” of the blog of Aaron Swartz (1986-2013) (“Full archives”, not quite : the older blog (entries), going as far back as 2002, if we remember correctly, is (are) only accessible through archive.org).

3. <https://twitter.com/aaronsw>

Description Twitter account of Aaron Swartz (1986-2013). (Who will finally write the biography of Aaron Swartz that he and we all deserve?)

Scientific journals

4. *Communications of the ACM*

Description A treasure trove for historians. (Forsythe, Knuth, algorithms, etc..)

5. *Journal of Functional Programming*

Description Primary journal for functional programming. (“Who’s Who” in the world of functional programmers/theorists.)

Legal documents

6. “UNITED STATES OF AMERICA v. AARON SWARTZ”.

Description We have long, long not reached a good understanding of the circumstances of USA v. Swartz. (The cowards, we know.)

1. Books and articles

6. Goldstine, Herman. 1993. *The Computer from Pascal to Neumann*. Princeton : Princeton University Press.

Description A first reference, especially regarding the second World War period (Herman Goldstine had worked on ENIAC). (The old model of the computer scientist-turned historian, by default.)

7. Abbate, Janet. 2012. *Recoding Gender. Women's Changing Participation in Computing*.

Description The most important of her works as far as we are concerned. (Women used to be everywhere in/around computing.)

8. Abbate, Janet. 1999. *Inventing The Internet*. Cambridge, MA : MIT Press.

Description Another notable work of hers. (A most needed complement to *Where Wizards Stay Up Late*.)

9. Hicks, Marie. 2017. *Programmed Inequality: How Britain Discarded Women Technologists and Lost Its Edge in Computing*.

Description The same as Abbate 2012 but different. (But, the same everywhere we go : women have been purged from “tech”.)

10. Akmut, Camille. 2018 [2017]. “Social conditions of outstanding contributions to computer science : a prosopography of Turing Award laureates (1966-2016).”

Description The equivalent of the Nobel Prize in computer science. (In retrospect the article we care for the least, but the one that was the most important, it got us started, so get started. (We do not remember which historian, despite possessing all the right credentials to do a “grand” academic career, we believe in the economic/rural history of England, had made a huge mistake right off the bat in his first, receiving an appropriate backlash from his elders : but, *that is OK*, we do our best, and not much worse can come out of it but start we must. (Hacker ethic.)))

11. Hodges, Andrew. 2014. *Alan Turing: The Enigma*. Princeton : Princeton University Press.

Description the reference biography. (Avoid the other one, below.)

12. Huang, Andrew. 2013. *Hacking the Xbox. An Introduction to Reverse Engineering*. San Francisco : No Starch Press.

Description One of the most important hardware hackers (read : computer scientists) of our times. (The “material” that got him a letter from MIT, who were already long cowards back then.)

13. Rossiter, Margaret. 1993. “The Matthew Matilda Effect in Science” *Social Studies of Science* 23 : 325-341.

Description (What happens) When men attribute to themselves the ideas of their fellow women scientists (or are attributed, and stay quiet).

14. Rossiter, Margaret. 1982; 1995; 2012. *Women Scientists in America*. (Vol. 1 : “Struggles and Strategies to 1940”. Vol. 2 : “Before Affirmative Action, 1940-1972”. Vol. 3 : “Forging a New World Since 1972”.)

Description So that the histories of computer science and technology from now on will include women, also, but not only (all those, who, whatever their minority characteristics, have thus far been excluded from history, including that of science). (The “Lynn Conway” effect.)

15. Copeland, Jack. 2012. *Turing. Pioneer of the Digital Age*. Oxford : Oxford University Press.

Description A most queer philosopher out of New Zealand (New Zealand again) : here is an idea, the Martians may have killed Turing, let’s look in all the wrong places, except the obvious ones, *just so we can be sure*. (The times of Alan Turing killed Alan Turing.)

16. Daylight, Edgar. 2014. “A Turing Tale” *Communications of the ACM* 57(10) : 36-38.

Description One of the most promising historians of computer science – if he would only turn to the issues of his times.

17. Daylight, Edgar. 2015. “Towards a Historical Notion of ‘Turing-the Father of Computer Science’” *History and Philosophy of Logic* 36(3) : 205-228.

Description Another article by him, but read the many others.

18. Lecuyer, Christophe. 2006. *Making Silicon Valley. Innovation and the Growth of High Tech, 1930-1970*. Cambridge, MA : MIT Press.

Description Absolutely fascinating book, if that is not real economic and social history applied to technology, then what is. (Probably, our favorite book after *Recoding Gender* and Tim Berners-Lee’s.)

19. Lee, J.A.N. 1995. *Computer Pioneers*. Los Alamitos : IEEE Computer Society Press.

Description If this isn’t a perfect source for prosopography, then we don’t know prosopography (a fancy word for collective biography). (This to say that we admit that biography, understood as that term is as applying to one person, has limitations, and much more can be learned by taking a group of interconnected people together (network).)

20. Lovelace, Ada. 1843. *Notes to “Sketch of the Analytical Engine invented by Charles Babbage”* In *Scientific Memoirs* 3, edited by Richard Taylor, 666-731. London : Richard and John E. Taylor.

Description The famous text. (She probably wasn’t the first programmer, as much as we would want.)

21. Misa, Thomas, ed. 2017. *Communities of Computing: Computer Science and Society in the ACM*. New York : Association for Computing Machinery.

Description an important compendium on the social aspects of computing.

22. Levy, Steven. 2010. *Hackers: Heroes of the Computer Revolution*. Sebastopol, CA : O’Reilly Media.

Description The “original” hackers. (Not the whole story.)

23. Akmut, Camille. 2019. “Hackers Revisited : the “original “hackers””. *Clever solutions, political acts.*”

Description More open problems. (Reinserting political and social elements where they have been removed.)

24. Williams, Sam. 2002. *Free as in Freedom: Richard Stallman's Crusade for Free Software*. Sebastopol, CA : O'Reilly Media.

Description An important social-political movement of our times.

25. Berners-Lee, Tim. 1999. *Weaving the Web: The Original Design and Ultimate Destiny of the World Wide Web by Its Inventor*. San Francisco, CA : Harper San Francisco.

Description The Web was invented as a way to further humanity. (Not a way to further companies' "profit-oriented" – as economics textbooks euphemistically put – priorities.)

26. Hafner, Katie and Lyon, Matthew. 1998. *Where Wizards Stay Up Late: The Origins of the Internet*. New York, NY : Touchstone.

Description The most popular history of the Internet. (The old model of the journalist-turned historian, by default, also, but for how long.)

27. Morrill, John. 1995. "A Nobel Prize in Mathematics" *The American Mathematical Monthly* 102(10) : 888-892.

Description why there isn't a Nobel Prize in mathematics, while, in our case, we don't have to look for long (computer science is too young).

2. Textbooks (computer science)

Contrary to the naive notions of a certain professor (though only in title, no more than the clothes of a philosopher make a fool a philosopher, no more than a mathematician or computer scientist can give anyone a royal road to their discipline), we are not abstracted from "muddling" with the material of computer scientists. They are simultaneously the materials of our times. At least once in your lives take intellectual risks, if not your lives proper. (They would have never been a Jean Cavailles – not in a thousands years, we all know that (what).)

28. Aho, Alfred, Sethi, Ravi and Ullman, Jeffrey. 1986. *Compilers: Principles, Techniques, and Tools*. Reading, MA : Addison-Wesley.

Description The reference book on compilers (preceded by an older).

29. Knuth, Donald. 1997. *The Art of Computer Programming*. Fundamental Algorithms. Volume 1. Third edition. Reading, MA : Prentice-Hall.

Description The first volume of this important sum is a "traversal one", and the most general and hence should be the priority.

30. Donovan, Alan and Kernighan, Brian. 2015. *The Go Programming Language*. New York : Addison-Wesley.

Description When computer scientists turn a blind eye to the social characteristics of their employer, as they now so often do. (Holds a "genealogical" tree of the origins of this particular language.)

31. Mead, Carver and Conway, Lynn. 1980. *Introduction to VLSI Systems*. Reading, MA : Addison-Wesley.

Description The reference book on VLSI.

32. Kurose, James and Ross, Keith. 2017. *Computer Networking: A Top-Down Approach*. Harlow : Pearson Education.

Description One of two important books on networks. (What we have described elsewhere as an “upside-down pudding”.)

33. Tanenbaum, Andrew. 2003. *Computer Networks*. Upper Saddle River, NJ : Pearson Education.

Description The other important book on this topic. (Though lacking in many ways, as the others.)

3. Newspapers and misc.

When working at the edge and frontier of our culture, that of our times, the reading of newspapers becomes and is an indispensable activity. We cannot rely on hundred years of sure scholarship, but we do our best with what we have : and, plenty is available and of good standard (many academics, who should, do not talk about these topics, these gentlemen and gentlewomen presumably resent lowering themselves to our times, of which they have extracted themselves in many other ways, preferring instead to focus on the 16th or 17th century that they have somehow managed to fashion in their feeble minds as places of higher intellectual activity, an untold mystery to everyone except themselves).

34. *The Guardian*

Description Critical articles – in an industry of computer-related publications that are notoriously uncritical – on various topics related to technology : e.g. tax evasion, “New Zealand” schemes, “Indian reservations”, worse galore. (The bottom is bottomless.)

35. *ProPublica*

Description Non-profit investigative journalism primarily concerned with U.S. affairs. (E.g. series on “algorithmic inequality”.)

36. *The Intercept*

Description Another “fearless” investigative publication. (E.g. articles such as “The Wiretap Rooms”, or the ones by Micah Lee.)

37. *Hacker News*

Description A good place to start, to keep up with the latest trends. (Y Combinator, Paul Graham.)

38. *Computer History Museum*

Description An institution dedicated to computer history e.g. oral interviews, primary sources, etc.

4. Methodologies

39. Piketty, Thomas. *Capital in the 21st century*.

Description (The greatest living economist) misses the mark on technology, and simultaneously and necessarily the 21st century.

40. Stone, Lawrence. 1971. "Prosopography" *Daedalus* 100(1) : 46-79.

Description The reference text on prosopography (i.e. collective biography).

41. Wittgenstein, Ludwig. *Tractatus Logico-Philosophicus*.

Description "The limits of our language are the limits of our world". (Language : In the end, no matter what field we choose to engage in, it all comes down to language, as one soon discovers and realizes – we cannot escape it – no matter if computer science, mathematics, economics or whatever else...).

42. Galbraith, John. *The Great Crash, 1929*. [Including an introduction by James Galbraith on the "Great Crisis" of 2008]

Description The (new) old cowboys of the financial world.

43. Canguilhem, Georges. 2011-? (ongoing?). *Oeuvres complètes*. Paris : Vrin.

Description His complete works, composed of many large volumes (currently 5), *still* not translated in English, an incalculable loss for the scientific, and not only community at large. (Georges Canguilhem, who, in all other ways, incarnated the figure of the intellectual to perfection – titles, clothing, language, though not manners with some, those he saw as losing his time – had left in many places of his otherwise academic work thousands of unforgiving judgments on the institutions, ideas and people of his time, that were remnants, reminiscences or reflections of his simple origins and involvement with the French Resistance, as a doctor of – not letters or philosophy – but medicine. Another meteorite fallen from the sky.) In particular volume 1, *Ecrits philosophiques et politiques 1926-1939*, give an insight into his more political writings – and philosophical, though both were interlinked. Such, that our understanding of him is only half.

44. Durkheim, Emile. 1956. *Education and Sociology*. New York : Simon and Schuster.

Description Family and education are two main sources of explanation for the behaviors of people, "nothing explains more than them" says Durkheim in this work. (A topic our professors would rather avoid, who come themselves increasingly from the same backgrounds as our elites, and cannot quite be rightfully said to come "from the people", a reality that is source of countless consequences on their abstract science.)

45. Engels, Friedrich and Marx, Karl. [1846] *The German Ideology*.

Description Our boys "went off" back in the days before *The Capital*. (The Brother Bauer's probably stopped writing after that.) The most acute description of the relationships between intellectual and economic forms of domination. (Jeff Bezos owns the *Washington Post*.)

46. Ettling, John. 1981. *The Germ of Laziness. Rockefeller Philanthropy and Public Health in the New South*. Cambridge, MA : Harvard University Press.

Description Our elites prefer concentrating on philanthropy – and have done so for decades – to obfuscate or avoid the topic of taxes. (Cf. Rutger Bregman’s recent talk at the Davos forum.)

46. Siegmund-Schultze, Reinhard. 2001. *Rockefeller and the Internationalization of Mathematics Between the Two World Wars*. Basel : Birkhauser Verlag.

Description More philanthropy, this time specifically applied to sciences. (more diversions) (philanthropy=diversion) (philanthropy=noTaxes)

4. Visual documents (documentaries)

47. Knappenberger, Brian. 2012. *The Internet’s Own Boy*.

Description : what probably started it all, long ago. (Aaron Swartz.)

48. Klose, Simon. 2013. *TPB AFK: The Pirate Bay Away from Keyboard*.

Description : that, or this. (If only our – their – justice was as diligent with bankers.)

49. Puttonen, Hannu. 2001. *The Code*.

Description : this, or that. (A hacker never finishes a program.) (Or *Revolution OS* – same year, different country.)

50. Florin, Fabrice. 1984. *Hackers: Wizards of the Electronic Age*.

Description : “A hacker never finishes a program”. (The other half left.)

The History of Computer Science and Technology

50 more references...

Camille Akmut

November 2, 2019

Abstract

A project conceived some time ago, and now finally completed. One hundred references to create a thousand more researchers!

Primary sources

Read : open problems.

Writings by computer scientists, technologists

1. **stallman.org**

Description a conundrum and vast labyrinth for generations upon generations of historians to come. The site is roughly divided into : news notes (the bulk of it, about 10-20 a day), articles (on free software and other subjects), and more personal writings.

2. **gnu.org**

Description the GNU project is both a philosophy and an actual, realized system (of inter-related software, or operating system). About 400 package maintainers and thousands of contributors, currently (first-hand source).

3. **lists.gnu.org**

Description (the many!) mailing lists for this collaborative project.

4. **planet.debian.org**

Description a "planet" is a collection of blogs, here from Debian's members. Not limited to technological topics. (There was never such a thing as "purely technical"...)

Legal documents

5. *General Data Protection Regulation.*

Description A landmark law (a so-called "regulation", in EU legal terminology). In particular art. 17, "*The data subject shall have the right to obtain from the controller the erasure of personal data*" (where, roughly, "data subject" means the user, and "(data) controller" means a company or any organization/institution).

II. Monographs

More open problems, at every turn of a page.

6. **Black, Edwin. 2012 [2001]. *IBM and the holocaust*. Expanded ed.. Dialog Press.**

Description Watson must have thought not unlike many of our modern technology CEO's in that June of 1934... He made a "killing" with Dehomag (trans. German Hollerith machines company), all the while managing to turn a blind eye to the great misery and tragedy that was unfolding all around him. (Contemporaneous posters gave its location in Lichterfelde, a district of Berlin to the South.) (Typology : journalist turned historian.)

7. **Sandberg, Sheryl and Scovell, Nell. 2013. *Lean In*. Knopf.**

Description central figure and cornerstone text of corporate diversity; a philosophy of false promises, and false premises. ("Purely impure", we called it, a reference to *The German Ideology*'s closing part on Saint Max, Max Stirner. Greed turned into virtue : another solution to what we've

called the "Galbraith equation", humanity's oldest problem. Saccharine is as close as Sandberg ever came to the lives of average, normal people – the brown, false sugar of the poor...)

8. Singer, Peter. 2016. *The Most Good You Can Do*. Yale University Press.

Description effective altruism, another peculiar philosophy of this epoch; favored by technological circles for good reason. (Singer and McAskill are truly the Bauer Brothers of our days. "The holy family" : Singer and sons... McAskill and brothers...) (Published by a private university, employed by one.) "*In its holy zeal against the mass, [effective altruism] pays it the finest compliment.*" For the average person to make donations is fine, but – listen up, it's not "the most good you can do"! An investment banker or tech CEO, on the other hand, emptying their pockets for change all the while implementing draconian, Dickensian working conditions back at home — now, *boy oh boy*, that is grand altruism, and must be grand philosophy! Singer and McAskill, let's be clear, are the scum of the earth : the lowest of the lowest of hanging fruits (spoiled, foul and ready to drop); meanwhile they parade themselves around Oxford or Princeton, and these gentlemen and gentlewomen of some education cannot even see through the poverty of their philosophy...

9. Barlow, John. 2018. *Mother American Night*. Crown Archetype.

Description contemporary Libertarian figure who created a widely adopted and highly influential vision of privacy conceived primarily as defense against the State (i.e. the 'big, bad' government – he had in mind, of course, the federal government of his country, the USA). His essay on cyberspace (opening with the lines "You weary giants of steel...") has never been more outdated, and couldn't be less relevant now.

Barlow, Singer, Sandberg : B.S.S. or $B.S^2$

Three cornerstones of currently dominant technology ideology...

10. Snowden, Edward. 2019. *Permanent record*. Metropolitan Books.

Description choice passages were promptly published in *The Intercept* ("...the things I think I had meant at the time"), but this does not explain much. Specifically, it doesn't explain the main problem, which is the political evolution of Edward Snowden, from extreme Libertarian (I hesitate to say even fanatic, and I don't want to say worse) to American, pan-political hero. The interviews with Ron Paul, the ideas on the New Deal that could not have been the product of a mere "kid", the friendships with well-known Libertarian figures, and just about a thousand other things that put and added together start making a lot of sense and paint a clear, consistent picture. "The other half" of the other half, in other words. Being 'fearless' perhaps starts with those subjects that are closest to us, and that hurt us the most — this hasn't occurred in this book, nor in this newspaper affiliated with its author, and cannot occur for most obvious reasons...

11. Wollenberg, Charles. 2008. *Berkeley*. University of California Press.

Description although I don't know exactly how, this book will surely be useful to people wishing to study or do research on this leading public university for computer science in the United States. Any history of a university, or research or educational institution, would be incomplete and lacking without some references to its city, district, neighborhood... (This was a major argument in Le Goff's book on the emergence of these peculiar places, built around specific, urban spaces.) Otherwise, start with the archives of the university, those of the department, and its *de facto* predecessors (most likely somewhere within, or *in-between* electrical engineering and maths) — don't forget the *The Daily Californian*, and perhaps the *Los Angeles Times*, both established shortly after the university. There would be other places to look at : clubs, laboratories, dorms, libraries, etc. (UT Austin, where Dijkstra taught for many years, would be another interesting subject.)

12. Suelette Dreyfus and Assange, Julian. 1997. *Underground: Tales of Hacking, Madness and Obsession on the Electronic Frontier*.

Description the beginnings of Julian Assange, among others.

13. Medina, Eden. 2011. *Cybernetic Revolutionaries: Technology and Politics in Allende's Chile*. MIT Press.

Description Project Cybersyn (in Chile). (I'm not sure about the perspective, or worth of this book — it's far from my own areas, but the originality if not uniqueness of its subject makes it noteworthy.)

III. Articles

14. JBHE. 1999. "No Need for a Calculator to Tabulate Black Computer Science Faculty at the Nation's Highest-Ranked Universities" *The Journal of Blacks in Higher Education* 24 : 69-71.

Description "(...) no blacks among the 550 computer science faculty at the nation's highest-ranked universities." Poor, poor, science, this computer science... It really does not understand itself. (And, I certainly did not need a calculator either — that's how little the secrets of this world are to anyone with an earnest wish, and will to understand it.)

15. Richard Bornat. 2009. "Peter Landin: a computer scientist who inspired a generation" *Higher-Order and Symbolic Computation* 22(4) : 295-298.

Description Peter Landin is a somewhat tragic figure within computer science (or heroic, depending on one's worldview). When he saw the uses that his discipline had, or was made to have, he gradually moved away from it... "son of an accountant father disabled in WW1", "Computing was never his entire life. He was always a radical in politics, a regular on demonstrations"...

IV. Textbooks

"Scholars", who live as Saint Jerome in his study, will never understand the point of this section...

16. Scott, Michael. 2016. *Programming Language Pragmatics*. 4th ed.. Morgan Kaufmann. ("an imprint of Elsevier")

Description The old(er) model of the PL (programming languages) textbook done in a comparative fashion; sometimes in excruciating detail (See chapter 6 for logic and comparison operators in multiple languages...). Largely based on imperative languages, the functional paradigm is treated as some sort of an after-thought in a back chapter (ch. 11). In the appendix, yet another genealogy of programming languages is found.

17. Friedman et al.. 2001. *Essentials of programming languages*. 2nd ed.. MIT Press.

Description the anti-thesis to Scott. Here, one language, Scheme, well-suited for the task due to its nature as a functional language (everything is a list which can be represented as a tree?), is used to explore similar ideas around the formal aspects of programming languages, instead.

18. Touretzky, David. 1989 []. *Common LISP: A gentle introduction to symbolic computation*. ?

Description "Although widely known as the principal language of artificial intelligence research – one of the most advanced areas of computer science – Lisp is an excellent language for beginners. (...) The student could be from any discipline, from computer science to the humanities." writes Touretzky here. (Preaching to the choir.)

V. Documentaries

19. Collective. 2006. *Steal this film*.

Description Aaron Swartz and Peter Sunde are interviewed. A young (and still idealistic) Fred von Lohmann makes a surprise appearance. The important historian Robert Darnton tells of censorship and the "pirates" of the printing press in 18th c. Europe; leading to apt comparisons with the so-called "pirates" of our age, and their criminalization.

20. Poitras, Laura. 2016. *Risk*.

Description In the middle of narration, Laura Poitras admits to having slept with Applebaum. And, while this is a great moment of self-reflective documentary filmmaking, it does raise questions as to the independence of these various journalists from their subjects. "A little too close for their own good", we wrote, and more, elsewhere. This would certainly explain why the press has remained uncritical so long. (I could have also mentioned Quinn Norton and Swartz, among others; a near-bottomless task I don't have the heart to undertake myself. Groupies and side-characters galore, the same patterns as found in Rock history...)

21. Csicsery, George. 1993. *N is a Number: A Portrait of Paul Erdos*.

Description the traveling mathematician of no home, no university affiliation, no possessions, and little ambitions; became one of the most productive (and collaborative) mathematicians of all times. Erdos' life strikes as so different from our modern computer scientists' – they have "a business on the side", we wrote of them disparagingly – that the inclusion of this documentary seemed warranted. Preceded the perhaps better known biography *The Man Who Loved Only Numbers*.

22. Sykes, Christopher. 1989. *Wittgenstein: A Wonderful Life*. BBC.

Description Another portrait of a scientist offered as contrast to our very *adroit*, modern-day computer scientists – we must give them that, *very adroit* : they flip-flopped like their circuits. At the height of his celebrity, disappeared to work anonymously in a variety of low-profile professions. (See also the more avant-garde 1993 *Wittgenstein* by Derek Jarman.)

VI. Fiction films and series

Historians don't know it yet, but this will soon become one of their many new sources. For a new history.

23. *The X-Files*.

Description Many prescient episodes on among others artificial intelligence and one NSA whistleblower. (S09E15 covers the death of The Lone Gunmen; they later became the subject of a series of their own, of same name.)

24. *Mr. Robot*.

Description Praised for the realism of its "hacking" scenes. Season 3 is one of the biggest sell-outs in television history. Not only couldn't they go through with the original narrative and gave up on it (i.e. crashing banks was a mistake), but they had to inject elements of supernatural (i.e. time hacking) just to be sure people wouldn't mistake any of it as something that might happen. USA Network -> (owned by) -> NBCUniversal -> Comcast -> the Roberts family dynasty. Billionaires, philanthropy, Hillary Clinton, the *whole* package! And, as such the show came full circle, too... ("Infrastructure" and "superstructure", etc. etc..)

25. *Buffy*.

Description female lead series enjoyed by a variety of technologists and computer scientists (Aaron Swartz, Conor McBride, etc.). An evolution of computers could be written by watching this show alone, and following the changes in the equipment used by, for instance, Willow (from clunky black laptop to sleek white one of a certain brand, "designed in California [but] made in China"...).

26. *Neon Genesis Evangelion*.

Description high-tech dystopia with children fighters and regular city-wide shutdowns; Christian motifs (the 3 Maggi, etc.).

27. Akmut, Camille. 2019. "The popular culture of computer scientists..."

Description a 4-part publication in which I attempted to point people in the right directions. As much included as twice not...

28. Lucas, George. 1971. *THX 1138*.

Description this is one film I didn't include, among a myriad of others. Android. Lucas before *Star Wars*. (His debut.)

29. Marker, Chris. 1997. *Level Five*.

Description the other, infinitely great director of French left-bank cinema (various collaborations with Resnais). Laura is a programmer...

VII. Fiction books

I had focused on popular rather than high culture, better traveled and covered.

30. Orwell, George. [1949]. 1984.

Description the doublespeak of technology companies, in which our language is in a constant state of re-invention, and where regressive is continuously attempted to be re-defined as progressive – sometimes very successfully so, at least temporarily. E.g. "flexibility" instead of precarity, e.g. gig economy workers are "(self-)entrepreneurs", e.g. "aggregation" not classification, and other such grotesque buffoonery; so extreme that even Orwell, who did not lack in imagination, couldn't have conceived. E.g. Uber is not a taxi business, hence it should not be submitted to the same overview. E.g. Airbnb is not a "traditional" real estate company, hence the regulations imposed on that industry does not apply to it. E.g. Delivery Hero (gig economy applied to food deliveries), is not a "real, real" business of the "old" restaurant industry, hence... well, you know the melody. Our politicians move to the rhythms of their songs, unbeknownst to them (our recommendation to them : replace everything they say with the opposite, and you'll get the original meaning or message).

31. Huxley, Aldous. 1958. *Brave New World Revisited*.

Description the "real sufferers of mental illnesses" are normal people argues Huxley. (Like Sandberg, for example, who, in her folly, that is so great, conceives of herself as a "revolutionary"...).

32. Dante. *The divine comedy*.

Description Dante had specifically meant to describe his contemporaries. This was no "historical" novel! Today, there would have been a place in Inferno and Purgatory (the best parts of this "comedy") for all of them. (Even the people in Paradise are not without faults...)

33. Dickens, Charles. [1843] *A Christmas Carol*.

Description It is never a bad time to read Dickens. Tech executives are the modern Ebenezer Scrooge's... (The adaptation with Alastair Sim.)

VIII. Methodology

Gary Younge quoted historian E.C. Carr recently : "The 19th-century fetishism of facts was justified by a fetishism of documents". *Independently we can add that no amount of archives ever made any history books, or historian. In the deaths of the Romanovs, some construct "a great tragedy", while others cannot help themselves and only see farmers and servants dancing and being merry together — "the (...) interests of the borrower [are not that] of the usurer" wrote Marx when he was working as journalist; but neither are those of Royal historians, old and new, and non-Royal ones, old and new. And, when Yurovsky pulled the trigger, he must have lost a big part of himself too — but none of this is something that is likely to be found in any archives.*

34. Engels, Friedrich and Marx, Karl. [1844]. *The Holy Family*.

Description complement and predecessor to *The German Ideology*.

35. Marx, Karl. [1844]. *Economic and Philosophic Manuscripts*.

Description this is what people mean when they say "the young Marx". (It's hard to picture how such texts could have existed in the 1840's. In fact, they remained unpublished until much, much later – about a century passed before that could happen.)

36. Le Goff, Jacques. 1993. *Intellectuals in the Middle Ages*. Wiley-Blackwell.

Description intellectuals more often than not do not know where they come from, or what their own history is — a fact of many consequences on their lukewarm science and oh-so gentle, delicate prose... In this grand book, which has not received the reception it deserves, Le Goff guides us through "schools of the city", and "monastic" ones, and constantly pokes us and asks : 'well, how do you feel this reflects on us?' But, one must (be able to) read between the lines...

37. Zinn, Howard. *A People's History of the United States*.

Description a look at history from down below, also called social history. Howard Zinn had not needed much imagination to put himself inside the bodies and minds of simple folks — he had come from them. Except, now historians rarely do, and it remains a life-long mystery to them why despite their best efforts they simply couldn't do anything worthwhile. They never could. (And, thus, by default, turned to studying merely other intellectuals, the only "milieu" they ever knew, but never quite understood...).

38. Eribon, Didier. *Michel Foucault*.

Description the reference biography of Michel Foucault. (His friend Paul Veyne had a copy in his attic library, with dedication if I remember correctly.) (The crossdressing prostitute, who might have been transgender, was out of Hamburg and its famous Reeperbahn, with the same reservation as before.) (I saw his partner, the sociologist Daniel Defert, at a screening of *Alexina*...)

39. Dover, Kenneth. 1989. *Greek Homosexuality*. Updated and with a new postscript. Harvard University Press.

Description a landmark study that had the effect of a small bomb upon its release, unheard of was a history book on a dangerous topic such as "homosexuality", coming from such a respectable scholar... (Though, his autobiography certainly paints a different picture.) The title itself is subversive, but its effect is lost on most. Greek homos'. In any case, I have proposed that the male-exclusive culture of hackers must have lead to similar patterns as found here (i.e. not modern homosexuality, but the Pederastic kind, closer to bisexuality). (I can't prove it, and for now we must rely on Levy's account, and dominant, heterosexual vision of the world. Peanuts and in-jokes with the bros...). This should be useful to anyone wanting to write a history of computer from an LGBT perspective.

40. Foucault, Michel. *History of sexuality*. Vol. 2.

Description the introduction is where Michel Foucault explains his attitude towards science (his own). He wrote to change the way he thought... (Writing about computer science and technology certainly changed the way I thought, far beyond what I had originally envisioned, or planned.)

IX. Newspapers

41. *Reuters*

Description the journalists' newspaper. (Reading the other newspapers after *Reuters* is sometimes depressing, so little they add that could help us better understand current events.)

42. *Motherboard (Vice)*

Description useful to me in one research, where I had made use of one of their documentaries, I re-discovered it as a surprisingly critical publication; resulting in surreal events...

43. *Jacobin*

Description generalist magazine with a Socialist, Marxist sensibility. Regular articles on technology-related topics. E.g. tech companies and their worker-annihilating policies, passed as the *nec plus ultra* of modernism, if not revolutionary in nature...

X. Misc.

The other 6 or 7 references are found in Bob Dylan and Nina Simone songs, for example, like the "Ballad of the Hollis Brown"... And, in life.

The history and sociology of computer science and technology : 26 references.

Camille Akmut

January 12, 2020

Abstract : Continuation, and possibly end, of a "peer review" started long ago.

ADMINISTRATIVE DOCUMENTS

- [1] Abelson, Hal et al.. 2013. *Report to the President. MIT and the Prosecution of Aaron Swartz*.

Description : Part I, pp. 16-28, is a detailed account including many technical and human details. The program written by Swartz was not described (and the few allusions to it, e.g. cookie faking, appear to be wrong), but we have done so elsewhere. Pp. 31-33 provide additional information as explanation (various antecedents).

"Before Aaron Swartz's suicide, the MIT community paid scant attention to the matter (...). Few students, faculty, or alumni expressed concerns to the administration." (p. 14)

(The flower of U.S.-American education and intelligentsia! An exciting and vibrant 'community of minds', no doubt...)

BOOKS

- [2] Wexelblat, Richard (ed.). 1981. *History of Programming Languages*. ACM.

Description : Sebasta (below) calls it *"Perhaps the most important source of historical information about the development of early programming languages"*.

- [3] Lessig, Lawrence. 2004. *Free Culture*. Penguin.

Description : Lessig deploys a vast culture, legal history and beyond. *"the Licensing Act of 1662 ... gave publishers a monopoly over publishing, as a way to make it easier for the Crown to control what was published."* Jack Valenti, mentioned by Swartz in a funny blog post, is named multiple times. In the preface, he notes : *"as I reread Stallman's own work ... I realize that all of the theoretical insights I develop here are insights Stallman described decades ago."*, naming "especially the essays in *Free Software, Free Society*".

- [4] Darnton, Robert. 1985. *The Literary Underground of the Old Regime*. Harvard University Press.

Description : I'm pretty sure this is the material that Darnton referenced (among possibly other publications) when he was interviewed for *Steal this film*. (Context : parallels between the "pirates" of the printing press and so-called "pirates" of our age.)

ARTICLES

- [5] Coleman, Gabriella. 2004. "The Political Agnosticism of Free and Open Source Software and the Inadvertent Politics of Contrast" *Anthropological Quarterly* 77(3) : 507-519.

Description : a monumental error in scholarship. To be clear, she denies them neither political views nor motives, her argument is complex : "*One might suspect FOSS of having a deliberate political agenda, but when asked, FOSS developers invariably offer a firm and unambiguous "no".*" It is the relationships around beliefs and practices that preoccupy this researcher. But, rarely has anyone been more wrong than Gabriella Coleman when writing of "*hacker aesthetic distaste for politics*"; obviously influenced by Levy. She does not distinguish enough between groups, resulting in a sociology that is more philosophy than social science, and concepts as "big as mountains" (as Bourdieu had written of Hegel) - "large ideas" she calls them, but this can only rarely be a compliment. Meanwhile Richard Stallman openly supports Bernie Sanders, and about a thousand other causes, a certain "open source" evangelist is a well-known gun loving, Libertarian fanatic, and Jamie Zawinski spends his days writing blog posts on e.g. Uber and Saudi Arabia... "Political agnosticism"? Jesus Christ.

- [6] Ochigame, Rodrigo. 2019. "The Invention of "Ethical AI". How Big Tech Manipulates Academia to Avoid Regulation" *The Intercept*, 20/12.

Description : "[These academics] *lent credibility to the idea that big tech could police its own use of artificial intelligence at a time when the industry faced increasing criticism and calls for legal regulation.*"

- [7] McCarthy, John. "History of LISP". In : Wexelblat 1981.

Description : when asked who gave him the permission to work on LISP, McCarthy responded : "*No one*" (Communist during his best years, later turned conservative.)

- [8] Akmut, Camille. 2019. "Aaron Swartz's JSTOR code. Further research notes."

Description : here I described `keepgrabbing.py`, the program used in the events described in [1] (where the emphasis was on networks, system administration policies and physical aspects), almost line by line. Additions to come later.

TEXTBOOKS

Anachronistic historians will still not understand the point of this section, so they may as well best skip it.

[9] Harvey, Brian and Wright, Matthew. 1999. *Simply Scheme*. 2nd ed.. MIT Press.

Description : from a historical perspective, the foreword by Hal Abelson (who quoted Perlis : "*Algol (...) belongs in a plumber's union*" — whatever that means) and preface by the authors are of particular interest; being representative of a certain epoch. The typical MIT/Hacker/LISPers-Schemers critique of Pascal, etc.. (See also the relevant entries in *The Hacker's Dictionary* e.g. "bondage and discipline language(s)".)

[10] Sebasta, Robert. 2016. *Concepts of programming languages*. 11th ed.. Pearson.

Description : chapter 2 is a short history of programming languages in fifty pages, from Plankalkul to PHP... Of the former we are told : "*Zuse's manuscript contained programs of far greater complexity than any written prior to 1945.*" The greatest language that never was... (One more genealogy at the beginning of this section.)

METHODOLOGY

[11] *Annales*

Description : legendary journal of legendary historians. (We produced a loose translation of Febvre's 1948 "On a certain style of history that is not ours", rather faithful to the spirit than the letter. He was not very courageous during the War, but at least showed integrity in his research, and that is much more than can be said of many modern "scholars"...)

POPULAR CULTURE

"Americans [not only] *tend to look down upon this form of culture. That's an unattractive characteristic of ours.*" (Lessig in *Free Culture*, writing about manga in particular)

[12] Clements, Jonathan and McCarthy, Helen. *The anime encyclopedia*. Stone Bridge Press.

Description : useful to anyone interested in the "inner lives" of computer scientists and technologists, in the tradition of Bachelard. (Look up the other books by these authors : *Anime: A history*, *A brief history of manga*, ...)

[13] Galbraith, Patrick. *The otaku encyclopedia*.

[14] Beck, Jerry. 2005. *The animated movie guide*. Chicago Review Press.

Description : "Every animated feature released in the United States since 1926".

[15] **Otomo, Katsuhiro (manga writer, director). 1988. Akira.**

Description : milestone in Japanese animation, all authors seem to agree. "the first Japanese anime movie to break out of small overseas science-fiction fan clubs and reach an art house and mainstream audience" writes Galbraith (who calls it "arguably the greatest anime of all time"), "the most expensive animated film produced in Japan at its release" notes Beck, while Clements and McCarthy argue "almost singlehandedly responsible for the early 1990s boom in anime in the English language." Clements and McCarthy propose further the convincing thesis : "Akira owes less to an alleged "cyberpunk" sensibility than it does to the young Otomo's perspective on 1960s counterculture".

Few other filmmakers can be said to have explored the themes around the new body and the new mind (called "shell", "ghost") as far as Oshii, and with as much talent, and as many insights as he did. Based on Shirow's work, which he often transcends.

[16] **Oshii, Mamoru. 1995. Ghost in the Shell.**

Description : The next big step for science-fiction anime films after Akira, with which it shares important characteristics (high budget, production quality, and brought anime to a new wave of fans). In turn, Clements/McCarthy tell us of it : "one of the few that could reasonably claim to be a true cyberpunk film." Beck notes accurately : "Oshii changed the setting from a futuristic Tokyo to a[n] ... anonymous Asiatic metropolis based more upon Hong Kong."

[16] **Oshii, Mamoru. 2004. Ghost in the Shell 2.**

Description : This follow-up movie, far from a commercial gimmick or exploitation, is actually a far more intellectual version (a collection of eclectic literary-philosophical references, presumably gathered in the 10 years separating the two films, regularly give rise to impromptu, surreal exchanges). Clements/McCarthy give this useful explanation : "Innocence draws heavily on a single chapter of the original manga ("Robot Rondo"), but while it uses characters and situations created by Masamune Shirow, it is largely the work of Mamoru Oshii."

"If our gods and hopes are nothing but scientific phenomena, then it must be said too that our love ..." (opening quote, *The Future Eve*)

[17] **Scott, Ridley. 1982. Blade Runner.**

Description : the authors cited in this section all trace back the aforementioned anime to *Blade Runner*. "Much of Japanese cyberpunk is influenced by Scott's

vision of "the city" in *Blade Runner*, a look that was in turn partially influenced by Tokyo's futuristic neon urban landscape. (...) [Its] themes, elements, and designs ... return again and again in anime and manga such as *Bubblegum Crisis*, *Akira*, *Ghost in the Shell*, and many others." writes Patrick Galbraith, for instance.

[18] Villeneuve, Denis. 2017. *Blade Runner 2049*.

Description : an interesting, further exploration of the themes developed in the 1982 film. (Blade runners are humans – in the original – or androids – here – whose task it is to terminate, i.e. "kill", older android models whose features are now considered a nuisance, undesirable or even dangerous for the status quo.)

[19] Sanders, Rupert. 2017. *Ghost in the Shell*.

Description : in a year or revivals, this *Ghost in the Shell* "live-action" version (anime fans slang for what everyone else calls simply a film...), added new interpretations, including more confusion to Shirow's basis – as almost all adaptations have done. To recap : Project 2501 is the "Puppet Master" (manga and 1995 film), Project 2571 is what led to "Major" (Motoko Kusanagi) and "Kuze" (Hideo) in this film, while 2502 is a new type of model, 'gynoid', at the center of the intrigue of the second, 2004 film...

[20] Groening, Matt. 1999-2003; 2010-2013. *Futurama*.

Description : in *Futurama*, the hardest problem of computer science had found an answer... (See the corresponding Computerphile/Numberphile video(s).)

[21] Roiland, Justin and Harmon, Dan. 2013-ongoing. *Rick and Morty*.

Description : referenced by Graham Hutton, J.-P. Aumasson, Jamie Zawinski... (*Rick and Morty* was to the 2010's what *Futurama* was to the 2000's.)

[22] Moore, Alan (writer) and Lloyd, David. 1982-1985 (B-W); 1988 (color). *V for Vendetta*.

Description : influential comic book (or "graphic novel"). See *The Guardian* article "Alan Moore drops anarchism to champion Labour against Tory 'parasites'" (21/11/2019) for more background on the author.

[23] Lang, Fritz. 1953. *The big heat*.

Description : one of the poster's in V's room. Cop fights injustice against all in a city filled with corruption (and "dames"...), in this film noir. (Part of Lang's so-called 'American period', which stood in stark contrast with his more complicated German past and ambiguous films like 'Metropolis', in which some recognize "Voelkish" i.e. proto-Nazi moods... Even Goebbels was impressed!)

[24] Esmail, Sam. 2015-2019. *Mr. Robot*.

Description : a counter-revolutionary work. In addition to other faults, already stated elsewhere, the creators made psychology a main factor of explanation : it was all down to childhood trauma, after all! They did it, not because the world is defined by objective inequalities, and that ought be enough reason, but – hopefully you’ve paid good attention – their motives could be explained by psychological factors. In the future, we will be able to say that *Mr. Robot* was a show that gave a lot of people hope, but was unfortunately cut short after only 2 seasons. The other two we must imagine ourselves. (Trope : trans/queer people as villains.)

[25] Taniguchi, Goro. 2003-2004. *Planetes*.

Description : so-called ”hard science fiction” (due to the attention paid to details e.g. the diapers worn by astronauts – although that is not the preferred technical term). Space exploitation, we are told, and shown, follows the same patterns as Earth exploitation : injustice and inequalities between rich and poor nations; giving rise to ”bad”, ”villain” terrorists...

[26] Amazon production. *The Expanse* (2015-...).

Description : it should be clear to anyone by now, hopefully, that these ’original’ Amazon or Netflix productions do carry some message, and fulfill a certain purpose (be it to offer elitist visions of space exploration, or to make capitalism more agreeable to us by passing their visions of work, or love, or sex, or adulthood for universal). A damning review appeared in *Jacobin* under the title ”Jeff Bezos and His Billionaire Space Fantasy” (14/12/2019).

”Jeff Bezos helped save the sci-fi TV show The Expanse because he wants to promote space colonization — on capitalist terms. But ironically, the show he saved depicts a grim and brutal life for workers on Earth and beyond.”

We are very far, here, from Roddenberry’s paternalist, but kind-hearted visions of space...

The History and Sociology of Computer Science and Technology. Conclusion. (4/4)

Camille Akmut

January 14, 2020

Abstract: review of available literature and source materials.

“There are, according to Leibniz, an infinite number of possible worlds”

WRITINGS

Primary sources.

— Ellis, Clarence. 2002. “Affective computing. The reverse digital divide.” In : Jones. (below)

“This document introduces the kid, Skip Ellis, and his odyssey through computer science. (...) It was obvious to any unbiased observer that the kid born in May, 1943, should be a mathematician within the Academy. [But] the kid was Black, and born in the Chicago ghetto.”

— Manning, Chelsea. 2010. “Manning-Lamo Chat Logs”.

“im kind of coming out of a cocoon... its going to take some time, but i hopefully wont be a ghost anymore”

(“The first pride was a riot”, she wrote 9 years later, to encourage others.)

— Swartz, Aaron. 2004. ”Stanford”. <http://www.aaronsw.com/weblog/001422>

Description : A series of posts by 15-year old Aaron recording his first ten days at Stanford. This is the old blog (many entries are gone, but recoverable via archive.org).

” This week we were repeatedly informed about the “unprecedented personal freedom” that we would have at Stanford. Apologies, but I don’t see it. (...) The whole thing is a giant privately-owned community, like some sort of Disney World. (...) It’s like I’ve woken up in some sort of libertarian nightmare world, where one company has bought up everything and now tells everyone what to do. Obviously there’s no freedom, but the ardent libertarians still say ”Look at how free you are! There’s no government telling you what to do!” If this is freedom, ... (...) Stanford is comically segregated. (...) segregated by engineering/humanities, why ...”

It is worth noting that already then he was well aware of universities’ tracking of networks and students, he wrote : *” They register your computer’s MAC address so they can track you if you take your laptop anywhere. (...) [the ID card] has a RFID transmitter in it, so they can track us while we walk.”* This provides further, hitherto not sufficiently explored context for the MIT/JSTOR events.

— Zawinski, Jamie. 2019. [On Uber, Saudi Arabia and Khashoggi]. <https://www.jwz.org/blog/2019/11/who-among-us-hasnt-dismembered-someone-with-a-bone-saw/>

Description : The purported ”aesthetic distaste” of hackers for politics...

ARTICLES

— Gibson, William. 2011. “The Art of Fiction No. 211” *The Paris Review* 197.

Description : origins of the word “cyberspace” and other iconoclast information on e.g. his dislike of “cyberpunk” (“*That label enabled mainstream science fiction to safely assimilate our dissident influence*”).

“I ... s[a]t down ... and start[ed] scribbling – infospace, dataspace. ... I got cyberspace on the third try ... I thought it sounded like it meant something while still being essentially hollow.”

Perhaps computer scientists and technologists, and the rest, ought to be more careful when readily re-using words such as those. (Let alone the whole Barlow-Libertarian spin and baggage added to it since.)

— Gibson, William. 2020. “I was losing a sense of how weird the real world was”. *The Guardian*, 11/01.

Description : another interview with this writer whose influence went far, far beyond literature. Drawing inspiration from programmers; they in turn drew from him.

“I was actually able to write Neuromancer because I didn’t know anything about computers. I knew literally nothing. What I did was deconstruct ... the language of people who were already working in the field. I’d stand in the hotel bar at the Seattle science fiction convention listening to these guys who were the first computer programmers I ever saw talk about their work. I had no idea what they were talking about, but that was the first time that I ever heard the word ‘interface’ used as a verb. And I swooned. Wow, that’s a verb. Seriously, poetically that was wonderful.”

— Rosenblum, Jonathan. 2019. “Amazon Is on the Attack Against Kshama Sawant”. *Jacobin*, 29/10.

Description : in public, they insist on distinctions between “technical” matters – their domain, and “political” matters – not theirs. But, meanwhile these companies are some of the most political institutions today. In Seattle, Amazon lobbied to undermine this city councilmember.

“Sawant has pushed a \$15 minimum wage, landmark renters’ rights legislation, free public transit (...) in addition to the record PAC contribution, at least eleven members of Amazon’s senior leadership team have donated to pro-corporate city council candidates”

— Kang, Minsoo. 2017. “The mechanical daughter of Rene Descartes: the origin and history of an intellectual fable” *Modern Intellectual History* 14(3) : 633-660.

Description : “the idea [that] Descartes [created an] automaton to deal with the loss of his daughter” is re-examined. (They did not miss the reference in *Innocence*.) Could serve as model for similar studies.

BOOKS

— Jones, Lee (ed.). 2002. *Making It on Broken Promises : African American Male Scholars Confront the Culture of Higher Education*. Stylus Publishing.

Description : Includes a testimony by computer scientist Clarence Ellis.

— Ferrieres, Gabrielle. 1950. *Jean Cavailles*. PUF.

Description : Gabrielle, sister of Jean. With a study of Cavailles by Gaston Bachelard. (Another example of countless texts that haven’t been translated yet – at least not to our knowledge.) (Subtitle : combat philosopher.)

— Peterson, T. F.. 2011. *Nightwork: A History of Hacks and Pranks at MIT*. MIT Press.

Description : pranks, the MIT boys played in the old days¹ – but, boy have things changed. (Abelson et al. continuously uses the word “neutral(ity)” in their *Report*, an astonishing 100 times, to describe MIT’s position in various matters; but we can also use another : cowardice. Cowardice on a personal level. Cowardice on an institutional one. In him, and a professor of economics, they found gentle, polite, well-behaved servants of centrist sensibilities...)

— Kushner, David. 2003. *Masters of Doom: How Two Guys Created an Empire and Transformed Pop Culture*. Random House.

Description : John Carmack (code) and John Romero (design), their company `id software` (ch. 4/5) and emblematic series of video games (ch. 8).

— Ruh, Brian. 2013. *Stray dog of anime. The films of Mamoru Oshii*. Palgrave Macmillian.

Description : we learn for instance that Oshii’s father was a private detective. (The members of Section 9, especially the duo of Batou and Togusa as depicted in *Ghost in the Shell 2*, remind much more of detectives than regular police.)

¹Putting police cars on one of the domes – that was still pardoned in 1994. But, challenging the interests of corporations, now that was different.

Another monograph is *The Cinema of Mamoru Oshii: Fantasy, Technology and Politics* by Cavallaro.

TEXTBOOKS

— Dasgupta, Sanjoy, Papadimitriou, Christos and Vazirani, Umesh. 2008. *Algorithms*. McGraw-Hill.

Description : These authors achieved the seemingly impossible : writing a modern algorithms book free of any references to corporations (Google, Facebook, Amazon, Microsoft). Their peers – we know – have other plans...

— Hutton, Graham. *Programming in Haskell*. Cambridge University Press. (multiple editions)

POPULAR CULTURE

... depictions of computer scientists and technologists, and their popular culture.

Figure 1: Reflect x2 – Computer scientist comments pop' commentary.

— **Gibson, William. 1986[1970's-1980's]. *Burning Chrome*.**

Description : People often cite *Neuromancer*, but this is really where it starts. A collection of short stories published before the better-known book : including "Burning Chrome" (first occurrence of the term "*cyberspace*"), "Johnny Mnemonic", "Fragments of a Hologram Rose"...

"... *Ono-Sendai VII. the "Cyberspace Seven" ...*"

— ***The X-Files* (1993-2002) additions**

Description : Gibson wrote the episodes "Kill Switch" and "First Person Shooter", which makes a lot of sense in hindsight (both deal with technology).

— **Longo, Robert. 1995. *Johnny Mnemonic*.**

Description : starring Keanu Reeves, four years before *The Matrix*.

— **Crichton, Michael. 1973. *Westworld*.**

— ***Westworld* (2016-...)**

Description : the now perhaps better-known series, about androids and their rebellion, at a theme park where the rich can finally live out their (mostly cruel, it turns out) fantasies.

— **Cameron, James. *Aliens*. 1986.**

Description : inspiration for *Doom*.

"Everyone at id was a huge fan of this sci-fi movie. They thought it would make a great game. (...) a cross between *Evil Dead II* and *Aliens*, horror and hell, blood and science." (Kushner 2003)

— **Mr. Robot (2015-2019) additions**

Description : referenced by Micah Lee (S04E09 discussion in *DigitalMunition*).

"Nobody in real life uses PGP. Except for *The Intercept*"

(They did update the keys on their website.)

— ***Doctor Who*, Fourth doctor (1970's-...)**

Description : referenced by Conor McBride.

"Oh, come on. Yes, you've failed. But, congratulations! Failure is one of the basic freedoms."

Bad risk thinking

What if we live in a simulation?

Figure 2: *Rick and Morty* and cryptography. (J.-P. Aumasson)

Some concluding words

Scholarly articles, monographs, textbooks, the prose of computer scientists and technologists, computer programs, animation, shares in Big Tech companies, conflict of interest forms, lawsuits, CV's, presentations, the e-mails of bankers. Even cryptographic keys! —

With this series of publications, and our work, we hope to have shown that, not only was computer science and technology subjectable to a critical history and sociology, but that it is now one of their prime objects.

Corrections

"White Heat" (1949) with James Cagney, not "The Big Heat" (1953) with Glenn Ford was one of the posters in V's room... Though, thematically at least, we'd like to think it would have had a place there too (and perhaps did have one, behind one of the furniture – but, we must use our imagination at this point).

Having mentioned it, I must now also comment on the following : more likely than *Alexina* is that I saw Daniel Defert at a screening of *Pierre Riviere* (the other case of an "abnormal" highlighted by Michel Foucault).

Early history of computing (17th c. onwards)

"The theme of Leibniz – to free men from slavery by the automation of dull but simple tasks – was next taken up by one of the most unusual figures in modern intellectual history, Charles Babbage (1791-1871)." wrote Goldstine.

To Leibniz he attributed "four great accomplishments to the field of computing": "his initiation of the field of formal logics; his construction of a digital machine; his understanding of the inhuman quality of calculation and the desirability as well as the capability of automating this task; and, lastly, his very pregnant idea that the machine could be used for testing hypotheses." He added (keep in mind the book was released in 1972) : "Even today there are only the beginnings of this type of calculation."

— Goldstine, Herman. 1993. *The computer from Pascal to von Neumann*. Princeton University Press.

Description : Part 1 covers "up to World War II", starting from 1600.

— Russel, Bertrand. 1992. *The philosophy of Leibniz*. Routledge.

Description : "Leibniz's philosophy was almost entirely derived from his logic", was the thesis defended by Russel (in his "first strictly philosophical" book per some commentators). His method : "Philosophic truth and falsehood (...) rather than historical fact"...

— Jolley, Nicholas (ed.). 2006. *The Cambridge Companion to Leibniz*. Cambridge University Press.

"Leibniz had certainly believed that a machine could, in principle, construct demonstrations, make logical inferences. He did not share Descartes's view that "reason" was a kind of supramechanical power of the soul, and he was hopeful about the possibility of actually constructing reasoning machines. But at least at the time of the New Essays, he had seemed inclined, after all, to reserve certain special functions to the soul; he suggests, for example, that it is only the incorporeal "I" which has a true identity and is capable of philosophically confirming it (cf. New Essays II xxvii, A VI.vi; RB 236-37)"

(From Catherine Wilson's contribution on 18th c. reception of Leibniz.)

An introduction to computer science research : selected papers with commentary

Camille Akmut

Abstract

A survey of contemporary computer science literature and themes.

Introduction

Somewhere in the ‘Purgatory’ part of the *Divine comedy*, Dante wrote about that “the first age of mankind was gold”.

But, how will *we* one day look back on this “first age” of computer science and technology, and computer scientists and technologists?

Such is still uncertain, and undecided. We can only speculate.

Will the judgments of our successors be as harsh as those of Dante, who at his mildest wrote further that those “who wasted time ... must now pay with time”¹?

Dante however did not have only scorn and contempt for his contemporaries or predecessors, found in the various levels of hell and purgatory; in many other passages his efforts are entirely to the celebration of others, first among them his guide Virgil, whom he calls “gentle father”.

Through Statius, he continues to declare his love for Virgil and those like Virgil who “carried their lamps behind them, not for their own use or good but for others [to make others wise]”.

¹In the Purgatory still.

Programming languages

— Abelson, Hal and Sussman, Gerald. 1985. *Structure and Interpretation of Computer Programs*. MIT Press.

Description : a revolution in programming languages pedagogy but far from any *nec plus ultra* (“nothing further beyond”).

— Turner, David. 1986. “An Overview of Miranda”.

Description : introduction of a programming language “to be wondered at” (Latin, traditionally female given name).

— Wadler, Philip. 1987 [1986]. “A critique of Abelson and Sussman - or - Why calculating is better than scheming”

Description : the influential textbook *Structure and Interpretation of Computer Programs* would be better served by languages like “KRC or Miranda” (designed by David Turner and inspirations for Haskell) argues this author. Sussman, if not then already, later seemed to agree, who called Haskell “the most advanced” of the current, or “old languages”; though he did not give enough insight into how exactly the “new languages” should look like, or be.

```
sum [] = 0
sum (x:xs) = x + sum xs
```

Here is the same definition in Lisp:

```
(define (sum xs)
  (if (null? xs)
      0
      (+ (car xs) (sum (cdr xs)))))
```

— O’Neill, Melissa. 2009. “The Genuine Sieve of Eratosthenes”. *Journal of Functional Programming* 19(1) : 95-106.

Description : the so-called “sieve of Eratosthenes”, a method of determining prime numbers, can be found in various textbooks on (lazy) functional programming and yet, according to the author, this popular version is not the sieve. We propose that this variant can also be called instead “the common sieve (of Eratosthenes)”.

Algorithms

— Hoare, C. A. R.. 1961. “Algorithm 64 : Quicksort” *Communications of the ACM* 4(7) : 321.

— Floyd, Robert. 1962. “Algorithm 97 : Shortest Path” *Communications of the ACM* 5(6) : 345.

Description : In a modern language (more modern than ALGOL 60), in imperative style still :

```
def shortestPath(m,n):

    INF = 10**10

    for i in range (1, n):
        for j in range (1, n):
            if m[j,i] < INF:
                for k in range (1, n):
                    if m[i,k] < INF:
                        s = m[j,i] + m[i,k]
    ...
    print(s)
```

— Madkour et al.. 2017. “A Survey of Shortest-Path Algorithms”.

Description : a contemporary survey from Dijkstra, Bellman and Floyd to present day improvements on them, and other solutions. Gives an insight into the kind of problems that computer scientists within this field of algorithms are concerned with (“putting another *log* in front of their algorithms” as we wrote...).

Time Complexity	Author
n^3	[52, 134]
$n^3(\log\log n)/\log n^{1/3}$	[55]
$n^3(\log\log n/\log n)^{1/2}$	[126]
$n^3/(\log n)^{1/2}$	[45]
$n^3(\log\log n/\log n)^{5/7}$	[71]
$n^3\log\log n/\log n$	[127]
$n^3(\log\log n)^{1/2}/\log n$	[141]
$n^3/\log n$	[27]
$n^3(\log\log n/\log n)^{5/4}$	[72]
$n^3(\log\log n)^3/(\log n)^2$	[28]
$n^3(\log\log n)/(\log n)^2$	[73]

Figure 1: The purgatory of “pure” computer scientists.

Cryptography / Security

— Kocher, Paul, Jaffe, Joshua and Jun, Benjamin. 1998. “Differential Power Analysis”.

Description : the original paper on power analysis (SPA and DPA) and breaking of cryptography; a form of so-called “side-channel attack” (in which hardware, not software properties or weaknesses are exploited). Contains, among many other things, a defense of multidisciplinary approaches in computer science (applicable to any science) :

If cipher designers, software developers, and hardware engineers do not understand or review each other's work, security assumptions made at each level of a system's design may be incomplete or unrealistic.

— Halderman et al.. 2008. “Lest We Remember: Cold Boot Attacks on Encryption Keys”.

Description : the original paper on “cold boot attacks” i.e. computer memory (RAM) and breaking of cryptography (specifically disk encryption); another form of side-channel attack :

Contrary to popular assumption, DRAMs used in most modern computers retain their contents for several seconds after power is lost, even at room temperature and even if removed from a motherboard.

and the colder the temperature the longer the decay or remanence of data, or information.

— Muller, Tilo, Freiling, Felix and Dewald, Andreas. 2011. “TRESOR Runs Encryption Securely Outside RAM”.

Description : answer (and solution) to Halderman et al. 2008. If RAM is compromised, let us move encryption procedures to the CPU area instead.

Networking

— Dingledine, Roger, Mathewson, Nick and Syverson, Paul. 2004. “Tor: The Second-Generation Onion Router”.

Description : the original paper.

We present Tor, a circuit-based low-latency anonymous communication service. This second-generation Onion Routing system addresses limitations in the original design by adding perfect forward secrecy, congestion control, directory servers, integrity checking, configurable exit policies, and a practical design for location-hidden services via rendezvous points. Tor works on the real-world Internet (...)

Computer graphics

— **Quake III Arena** source code. 1999.

Description : “the legendary ‘inverse square root’”. See Sanjay Madhav’s *Game Programming*, pp. 46-47.

Artificial Intelligence

— Vinyals, Oriol and Le, Quoc. 2015. “A Neural Conversational Model”.

Description : an artificial intelligence is asked among other things “what is the purpose of life?” with surprising – sometimes contradictory, sometimes uneasy – answers and outcomes (“to live forever”).

— Akmut, Camille. 2019. “Minerva and Virgil – a program (Notes on Karpathy et al. 2014)”.

Description : an introduction to this peculiar literature of most peculiar authors (and simultaneously contradiction). More than any of their colleagues perhaps these “most adroit” gentlemen and gentlewomen had “danced on all feet and to all songs”. Posterity is likely to be very harsh on them : *they danced, we laughed*.

(in order of appearance)

<https://www.cs.kent.ac.uk/people/staff/dat/miranda/overview.pdf>
<https://www.cs.kent.ac.uk/people/staff/dat/miranda/wadler87.pdf>
<https://www.cs.hmc.edu/~oneill/papers/Sieve-JFP.pdf>
<https://arxiv.org/abs/1705.02044>
<https://www.rambus.com/wp-content/uploads/2015/08/DPA.pdf>
https://www.usenix.org/legacy/event/sec08/tech/full_papers/halderman/halderman.pdf and <https://citp.princeton.edu/topics/memory/>
https://www.usenix.org/legacy/event/sec11/tech/full_papers/Muller.pdf
<https://www.freehaven.net/anonbib/cache/tor-design.pdf>
<https://dx.doi.org/10.17613/59fm-7y72>
<https://arxiv.org/abs/1506.05869>

Introduction to computer science research : more papers discussed.

Camille Akmut

Abstract

Research from various fields within computer science is reviewed.

Algorithms

— Knuth, Donald. ongoing. *The Art of Computer Programming*.

Description : these volumes will be of different interests and uses to different people. Notable is the inclusion of passages called “History and bibliography” at the end of each section (before the exercises); In these, Knuth deploys enormous knowledge of his field to state exactly authors of algorithms, and their various circumstances. (As to the correctness of the provided information, others will decide but he must certainly be praised for at least attempting such a task : in his colleagues’ works, too often, algorithms seem to be the product of some immaculate conception, of no parents and no history...). Volume 1 (“Fundamental Algorithms”) and 3 (“Sorting and Searching”) appear as the most widely usable : they cover common data structures and algorithms (e.g. 2.2. lists, 2.3 trees, 5.2. sorting, etc.).

Computer graphics

— Newell, Martin. 1975. *The utilization of procedure models in digital image synthesis*. University of Utah. (PhD thesis.)

— ACM SIGGRAPH 1987. Conference proceedings in : *Computer Graphics* 21(4).

Description : the famous ‘Utah teapot’. Other such 3D test models or “benchmarks” include the ‘Cornell box’, ‘Stanford Bunny’, ‘Dragon’, OpenGL Gears... (Unfortunately neither this thesis nor this conference’s proceedings, where the teapot was widely featured, are readily accessible.)

(a) Original teapot at the Computer History Museum. (b) Toy Story (1995) at c. 15 min, by Pixar (co-founded by former Utah student).

Figure 1: The many lives of the ‘Utah teapot’.

Cryptography

— Perrin, Trevor and Marlinspike, Moxie. 2016. “The Double Ratchet Algorithm”.

Description : Specification. Sections 3 and 4 contain example Python implementations, 8 has useful references.

A KDF chain is a core concept in the Double Ratchet algorithm. (...) A KDF chain has the following properties (...) Forward security: Output keys from the past appear random to an adversary who learns the KDF key at some point in time. Break-in recovery: Future output keys appear random to an adversary who learns the KDF key at some point in time, provided (...)

— Cohn-Gordon et al. 2016. “On Post-compromise Security”.

In this work we study communication with a party whose secrets have already been compromised.

Description : By the same authors of “A Formal Security Analysis of the Signal Messaging Protocol”, where more information can be found.

Some more background : Gentlemen in this field of cryptography are both authors of some of the most exciting, practical and vitally important research in computer science, and creators simultaneously of some of the least consistent, coherent terminology encountered.

“Forward secrecy” means past messages cannot be decrypted in the event of a compromise (contrary to older systems like PGP, where a long-lived private key decrypts all messages). “Future secrecy” goes further by trying to achieve this but for future messages! (A ‘self-healing’ property.)

(The corresponding Computerphile video is entitled “Double Ratchet Messaging Encryption”. See 2:45-3:05 for a brief discussion of ‘forward security’, and 3:05 onwards ‘future security’.)

Programming languages

— **Rafkind, Jon and Flatt, Matthew. 2012.** “Honu: A Syntactically Extensible Language”.

Description : towards Scheme without parentheses and prefix (algebra) notation.

— **Doets and Eijck. 2004.** *The Haskell Road to Logic, Maths...*

— **O’Donnell et al.. 2006.** *Discrete Mathematics Using a Computer.*

Description : two innovative textbooks making use of a programming language (Haskell) to introduce mathematics.

CHAPTER 5. TREES

for instance is the (tree) representation of the formula :

$$(3 \times 4) + ((5 \times 6) \div 8)$$

```
Prelude> (3*4)+((5*6)/8)
15.75
```

— **Wirth, Niklaus. 2005.** “Good Ideas, Through the Looking Glass”.

[about OOP, Java and co.] *Nevertheless, the careful observer may wonder (...) Was this change of terminology expressing an essential paradigm shift, or was it a vehicle for gaining attention, a “sales trick”?*

Description : here Wirth looked back on half-a-decade of computer science culture. (I know that there are at least two versions of this : the one that was published, and another one containing additional passages – some of them extremely harsh and unforgiving.) Should prompt many to reconsider what, indeed, computer science is...

(in order of appearance, when available)

<https://signal.org/docs/specifications/doubleratchet/>

[/watch?v=9s02qdTci-s](#)

<http://www.cs.utah.edu/~rafkind/papers/honu-2012.pdf>

https://inf.ethz.ch/personal/wirth/Articles/GoodIdeas_origFig.pdf

Illustrations

Figure 1 (a) : Glydeck, <https://glydeck.blogspot.com/2011/08/who-remembers-utah-teapot.html>

The popular culture of computer scientists, hackers and programmers. From *Star Trek* to *Buffy* – First research notes.

Camille Akmut

Abstract

Research notes: *The Matrix*, *Star Trek*, *Buffy*, *X-Files* & co.

Introduction

In this paper we understand “popular culture of computer scientists...” in the double meaning of : popular culture representations of them; and, on the other hand, their own popular culture. Both reflecting and influencing one another.

We offer these research notes in the hopes of helping others, of helping them not err, and go further and faster than ourselves.

While interesting, we held this particular enterprise – and these sorts of projects in general – to be of the lowest priority, hence pushed it to the very back, or end of our list.

We trust our ‘average intellectuals’ and historians to be able to undertake it one day, as part of some “cultural history”, if nothing else (and perhaps for the best);

Soon these scholar weathercocks will claim to have “felt” the importance of these various topics from the earliest hour; like a certain professor whose eyes were constantly full of dollar signs like in *Donald Duck* comics, so for instance when she raved about having recruited a post-doc whose family member was “*very ‘high up’ at Google*”, so she told, she saw dollar signs then too;

It is these same who make grandiloquent speeches about open access – speeches that would save the world if speeches could have such an effect; but even the briefest review of their publishing activities shows otherwise. They have no pride, and no decency;

(If they had a role inside this popular culture, they would be either ‘The Wolf, the Ram and the Hart’ or ‘Cancer Man’.)

and we shiver already at the thought of perhaps having to read their papers one day, when and once even the most average among them will have finally caught on to their own times... Poor profession.

1 *The X-Files* (1993-2002)

1.1 Referenced by

— David Malan as part of Harvard’s CS50 class : among examples and illustrations of the “enhance” trope (i.e. fictional, unrealistic techniques through which seemingly or technically impossible amounts of (visual, digital) information are recovered).

1.2 Selected episodes

S01E07 (“Ghost in the Machine”)	artificial intelligence (and dangers of); political, moral and philosophical responsibility of creators.
S02E25 (“Anasazi”)	anarchist computer hacker known as ‘The Thinker’, fourth member of Lone Gunmen.
S04E09 (“Synchrony”)	takes place at MIT with various researchers of that same institution; time travel was a mistake in hindsight.
S05E03 (“Unusual Suspects”)	the origins and formation of the ‘The Lone Gunman’ (by two electronics makers-vendors and a FCC employee, at a convention); from inoffensive DnD nerds to JFK and Roswell theorists, upon meeting Susanne Modeski.
S05E11 (“Kill Switch”)	Donald Gelman (‘Silicon Valley pioneer (...) he invented the Internet’); Invisigoth.

1.3 Selected excerpts

S01E07

Wilczek - If I’m protecting anything, it’s not the machine.
Mulder - Then what?
Wilczek - After the bomb was dropped on Hiroshima and Nagasaki
Robert Oppenheimer spent the rest of his life regretting he’d
ever glimpsed an atom.
(...)
Wilczek - He loved the work, Mr Mulder.
Mulder - His mistake was in sharing it with an immoral government.
Wilczek - I won’t make the same mistake.

S02E25

(The Thinker is reading the 50 Greatest Conspiracies Of All Time
while his computer is trying to log in passcodes. (...))

1

S04E09

¹<https://scifi.media/x-files/transcripts/>

Jason - Understand what?

Old Jason - What she created. What you - we - helped to create. A world without history, without hope. Where anyone can know everything that will ever happen. I've seen that world.

S05E03

Figure 1: “(...) 20. Daddy needs a new Sword of Wounding.”

S05E11

Byers - Jobs and Wozniak at Apple, Gates and Allen writing BASIC, the Homebrew Computer Club's first meetings. Gelman was there.
Frohike - Now they're powerbrokers and billionaires. Back then they were just 'inspired nerds'.
(...)

Byers - Gelman was a part of the group, but not 'one of them'. (...)

Langly - He wrote some of the earliest viruses.

Mulder - And found himself under investigation by the NSA.

(...)

Byers - Gelman was a visionary, not a capitalist. A subversive.

(...)

Mulder - That may be what got him killed.

Langly - Heavy casualty.

Frohike - A brother goes down.

Scully - We need a name. Your real name.

Invisigoth - Invisigoth. You want my address? It's t-o-a-s-t.

Figure 2: Invisigoth halts only after a first shot is fired.

(...)

Invisigoth - 'Automata Theory', MIT, '95. Post doc, the Santa Fe Institute.

Figure 3: Invisigoth's home : a container.

2 *The Matrix* trilogy (1999;2003)

2.1 Referenced by

— Nmap website / documentation

Figure 4: Trinity uses Nmap in *The Matrix Reloaded* (2003) (source : nmap.org).

Commands used, shown are :

```
# nmap -v -SS -O 10.2.2.2
# sshnuke 10.2.2.2 -rootpw="Z10N0101"
# ssh 10.2.2.2 -l root
```

References to *The Matrix* trilogy appear not only in Nmap's website's section dedicated to movies featuring it², but including inside the official documentation for this software :

Emphasis Using Nmap from your work or school computer to attack banks and military targets is a bad idea.

(...) *Trinity scanned the Matrix with the command nmap -v -SS -O 10.2.2.2.*³

²"Nmap In The Movies". <https://nmap.org/movies/>

³*Nmap Network Scanning*. <https://nmap.org/book/conventions.html>

— Aaron Swartz

Where is the visual integrity of The Matrix? The hyperreal cinematography that made the film such a beauty? Not in The Matrix: Reloaded, which in comparison looked like a bunch of large fight scenes wrapped in some Phantom Menace-class patter.

The fight scenes didn't even have a purpose most of the time. Agent Smith can endlessly duplicate and Neo can fly away whenever he wants. There's nothing more that Neo needs, so why does he stand around fighting for twenty minutes? And in the freeway scene, they're nominally supposed to be looking for an Exit, but after the first ten minutes they forget that and move on to blowing up large trucks.

Sure, it was a fun generic action movie, but it's not in the same class as the original.⁴

— Leah Rowe

The Matrix is about transgender people. (...)

It's a Friday evening, and I'm watching one of my favourite films of all times. The Matrix, made in 1999 by the Wachowski Sisters.

(...) Both of them came out as transgender several years ago.

(...)

To most people, the Matrix is a simple science fiction film. It depicts the story of a world which exists inside of virtual reality, with its inhabitants inside unaware of this. The VR simulates the end of the 20th century, in a large city located somewhere in the United States.⁵

More information on this can be found in *The New Yorker's* 2012 "Beyond the Matrix", in which Lana Wachowski came out to the public :

"I have a formative memory of walking through the girls' line and hesitating, knowing that my clothes didn't match," (...)
"But as I continued on I felt I did not belong in the other line, so I just stopped in between them."

This was an important event as Lana was perhaps the only transgender woman, person altogether to have such mainstream notoriety at the time.

3 *Buffy* (1997-2003), *Angel* (1999-2004)

3.1 Referenced by

— Aaron Swartz : known primarily as major fan of *Buffy the Vampire Slayer*, and other works by Joss Whedon.

⁴ "Matrix Unloaded" (May 15, 2003). <http://www.aaronsw.com/weblog/000921>

⁵ <https://notabug.org/vimuser/sleepless/src/master/matrix.md>

In his very first writing about the series that we know, “Joss Quest” he explains :

*I have a confession to make. On February 21, 2003 on watched my first episode of Buffy the Vampire Slayer (6x09). I'm not sure why I did, or why I chose then, or why I chose that episode, but I do know this: I was blown away. I spent all day thinking about it, unable to get it out of my mind, craving more. Since then, I have watched every aired episode of Buffy, spinoff Angel, and creator Joss Whedon's other show, Firefly, from the beginning, in order. On May 20, 2003, three months later, the final episode of Buffy aired and my quest is done.*⁶⁷

Note that this is an example of an entry that cannot be found in the, in fact, incomplete so-called “Full Archives” index of *Raw Thought*. – as we had already pointed out.

In episode 9 of season 6, entitled “Smashed” (a likely play on this word’s many meanings), Buffy has careless sex with Spike, Willow who has just broken up with Tara loses control over her magic powers, herself; a scene features homophobia.

He then goes into great detail about downloading (parts of) the show and the ethics of downloading :

*It's arguable whether (...) downloading is illegal, but it's almost certainly moral.*⁸

wrote then 16 years old Aaron.

He followed this up with a critic of Hillary Rosen and Jack Valenti (RIAA and MPAA heads respectively) :

*But this logic is too complex for Jack Valenti (...). In a Guardian article he's quoted as saying “There is no business model on this Earth that can compete with free.” Um, hello? Did you ever notice that these shows are available for free already, Mr. Valenti?*⁹

In another such post, he explained his attitudes towards television more generally, all the while re-iterating his love for *Buffy* :

For many years I proudly avoided TV. Everything I saw on it was, to a greater or lesser extent, boring and anti-intellectual. This was so pervasive that I became convinced it was a flaw of the medium itself: television (I figured), with its constant commercial breaks and 44 minute cap, had nothing to teach us and was incapable of communicating emotion. Then I discovered Buffy.

⁶ “Joss Quest” (May 20, 2003).

⁷ <https://web.archive.org/web/20030522234516/http://www.aaronsw.com/weblog/000921>

⁸ Ibid.

⁹ Ibid.

*Here was a show that communicated drama, emotion, life lessons, and facts, while doing it with beauty, grace, and humor. I was hooked.*¹⁰

In another one, Aaron mentioned the wider Buffyverse, in which he includes *Miracles* (2003-present), executive produced by David Greenwalt (co-creator of *Angel* with Jess Whedon), and influenced by *X-Files*.

*all three Buffyverse shows (Buffy, Angel, and Miracles) (...) What's that you say? Miracles doesn't take place in the Buffyverse? I beg to differ.*¹¹

He also referenced Joss Whedon's follow-up show *Firefly* (2002-2003) and accompanying film *Serenity* (2005) in a related blog post :

*So Buffy ran its course, Angel got canceled, and Firefly saw its untimely demise. But all is not over for Joss Whedon – Firefly is back, this time in the form of the feature film Serenity. Along with the rest of the diehard Joss Whedon fans, I'm on the edge of my seat. By all accounts the film is going to be amazing.*¹²

Followed by a review a few days later (as he got to see the movie before everyone else).¹³

Other 'lost' early posts dedicated to *Buffy* and connected shows include :

- “Comments on the Buffy Series Finale (7x22)” (2002)¹⁴
- “The Connection Between Miracles and Angel” (2002)¹⁵

among others, presumably.

—

In a memorable closing scene, the heroine Buffy, who had just previously recognized that “*we hurt the ones we love the most*”, realized – now having gone through her journey and being on the brink of adulthood – that “*a couple of things are actually starting to make sense*”. (‘Cookie dough’ speech.) Willow is a hacker while Fred is a physicist (*Angel*).

4 *Star Trek: The Next Generation* (1987-1994)

4.1 General notes

The ‘diplomatic’ turn in this series, breaking with the more action-oriented space adventures of pasts. Led by a memorable intellectual captain (Jean-Luc Picard).

¹⁰ “What’s Good on TV” (September 12, 2003). <http://www.aaronsw.com/weblog/001035>

¹¹ “Joss Update” (June 02, 2003). <http://www.aaronsw.com/weblog/000938>

¹² “Serenity” (September 24, 2005). <http://www.aaronsw.com/weblog/serenity>

¹³ “Serenity: A Review” (September 29, 2005). <http://www.aaronsw.com/weblog/serenity2>

¹⁴ <http://www.aaronsw.com/2002/buffyFinale> (undated except for URL)

¹⁵ <http://www.aaronsw.com/2002/angelMiracles> (same remark)

In the 24th century, human pains and needs are gone and mankind has left behind its petty traits of the 20th and 21st centuries.

4.2 Referenced by

David Malan in Harvard's CS50 'Introduction to Computer Science' : the "enhance" trope, still.

5 Others

Star Trek (1966-69); *Star Wars*, 'original trilogy' (1977;1980;83); *Ghost in the Shell* (1995); *Neon Genesis Evangelion* (1995-96); *Mr. Robot* (2015-19).

Figure 5: The loneliness of Motoko Kusanagi (he/she/they/*).

```
As I wandered the various networks  
I became self-aware.  
My programmers considered it a bug  
(...)  
I called myself a life-form
```

6 References

Mangan, Lucy. 2017. “Buffy the Vampire Slayer at 20: the thrilling, brilliant birth of TV as art”. *The Guardian*, 10/03.

Description Contrary to uninformed opinions of columnists, *Buffy* did not mark ‘the birth of TV as art’, but Lynch’s *Twin Peaks* (1990-1991) did (and *TNG* before it).

Seitz, Matt. 2014. “Twin Peaks Helped Carve Out Today’s Prestige-TV Landscape”. *Vulture*, 06/10.

—. 2015. “David Chase on the Legacy of Twin Peaks”. *Vulture*, 07/05.

Description Infinitely better, and better informed articles.

mogsam. 2015. “A Philosophical Analysis of Ghost in the Shell (1995)”. *The Vault* (McMaster University), 20/01.

The popular culture of computer scientists, hackers and programmers. Part II.

Camille Akmut

July 20, 2019

Abstract

More of *The X-Files*, *The Matrix* and co. (including *Sense8*).

1 *The X-Files* (1993-2002)

1.1 Selected episodes

S07E13	When virtual reality and gaming goes wrong.
--------	---

1.2 Selected excerpts

S07E13

Figure 1: The modernist architecture preferred by tech companies.

FPS employee - I need to scan your ID. Retina scan, please.

Mulder - Cool.

(...)

FPS employee - I'll need you to look over those non-disclosure agreements.

Scully - "To protect all proprietary or intellectual property owned by FPS, a private California corporation, under the harshest penalty of law."

(...)

Scully - I can get in the Pentagon easier than this.

(...)

Langly - Welcome to the land where silicon meets silicone.

Frohike - Can I get you a latte from the bar, or perhaps a bottle of designer H2O?

(...)

Langly - Take a moment just to feel the pulse of the new American gold rush.

Byers - You're standing on the launch pad of a rocket headed for the stars.

Scully - OK.
 Frohike - There's been a little accident.
 Scully - What kind of accident?
 Langly - Like uh... an industrial accident.
 Scully - How did the victim die?
 Byers - Uh...
 Frohike - Uh : It's not exactly clear.
 Byers - Right.
 Langly - Mm-mm.
 Scully - Was their equipment involved?
 Byers - No.
 Frohike - Yes.
 Langly - Yes... and no.
 Scully - What's your business here?
 Langly - Our business?
 Frohike - We're, we're consultants to FPS.
 Byers - Langly did some programming for them. He created all of the bad guys.
 (...)

Frohike - We don't want to give you the idea we're major profit participants.
 Mulder - Cash or stock options?

Figure 2: The non-separation of “the political” and “technical”.

Langly - [Options] Vested immediately with a short-term exercise against venture collateral
 to bypass SEC regs.
 Byers - The IPO's in a week.
 Frohike - Game ships on Friday. 50 malls across the United States and Japan.
 (...)

FPS CEO - Total bleeding-edge technology.

1.3 Note

In this particular episode of the seventh season of X-Files, which covered the years from 1999 to 2000, a good representation of attitudes at the time is conveyed, where the general excitement and naivety with which new technologies were welcomed by the public also met some skepticism (attitudes roughly represented by Mulder and Scully here respectively); meanwhile those behind these technologies (i.e. members of the Lone Gunmen) could only explain with discomfort the reasons for their shortcomings and failures – and their own involvement in them.

FPS Corporation and their main product seem to be inspired by iconic game studio *id Software* and some mixture of their games *Wolfenstein 3D* (1992) and *Doom* (1993).

Figure 3: An advertisement for their main product.

Meanwhile the staff of this fictional company prefigure contemporary technology CEO's and personnel : a general disconnect with reality – financial optimization schemes, grandiloquent speeches, and great lack of empathy included.

The realities and tropes of this world continue with Darryl Musashi, a “rock star” or “10X” programmer.

Figure 4: Programmer Phoebe : *“I was just gonna take a nap. I’ve been up for 70 hours straight, analyzing code, trying to fix the game.”*

Phoebe, a programmer at this company, seems to be the only person there to have some non-commercial interest in solving the problem.

You don’t know what it’s like. Day in and day out choking in a haze of rampant testosterone. (...) She was all that kept me sane.

2 *The Matrix* trilogy (1999;2003)

2.1 Referenced by

— Jamie Zawinski (jwz)

I re-watched all three (...) on the occasion of its 20th anniversary. The first one is still a fantastic piece of filmmaking. That first scene, where we see Trinity performing the most incredible ass-kicking we’ve ever seen, and then she learns that Agents are inbound and she just turns tail and runs. She’s afraid of someone? That’s how you set the stakes. Also the dojo scene: “Do you think that’s air you’re breathing?”

The second two... can confirm: they are still an incoherent, babbling mess, and they make you like the first one less in retrospect. The freeway chase is pretty good. The Merovingian has a nice suit. That’s about it.

And it reconfirms something I thought about Sense8: “Did they love that ‘Burning Man rave in Zion’ scene so much they had to expand it to 12 episodes? Yeah, I think they did.”¹

¹ “Recent movies” (2019). <https://www.jwz.org/blog/2019/02/recent-movies-24/>

And, in another blog entry (among many others) :

There are only 4 essential movies about VR: Brainstorm, Videodrome, Strange Days and The Matrix. (...)

*Another thing about Brainstorm that I don't see mentioned often is how real the corporate environment felt. As someone who spent the late 80s in and around university-adjacent tech startups (...)*²

Figure 5: Jamie Zawinski in *Code Rush* (2000).

“One of the best programmers I ever hired had only a High School degree; he’s produced a lot of great software, has his own news group, and made enough in stock options to buy his own nightclub.” says Peter Norvig of Jamie Zawinski, referring to his pioneering work at Netscape / Mozilla among others³.

3 *Sense8* (2015-2018)

3.1 Referenced by

— Jamie Zawinski (a.k.a. jwz)

² “Brainstorm” (2019). <https://www.jwz.org/blog/2019/01/brainstorm/>

³ In his essay “Teach Yourself Programming in Ten Years” (Copyright 2001-2014). <https://norvig.com/21-days.html>

It wasn't bad – though I feel like nearly every idea in it had already been exploited, better (...). Sense8 has a much bigger travel budget, though. It's also just loaded with pandering and cliches, and every sub-plot eventually trudges toward the most obvious-possible happy ending.

(...) it left me wanting to scream “You incurious motherfuckers!” at the TV multiple times. (...) ⁴

3.2 Selected episodes

S01E02	Nomi Marks, a ‘hactivist’ and trans woman, writes a blog entry telling her story on the occasion of Pride.
S01E07	Bug, Nomi’s old friend and fellow hacker, re-unites with her. (his first appearance)
S01E011	More of Bug.

3.3 Selected excerpts

S01E02

For a long time, I was afraid to be who I am
because I was taught by my parents
that there’s something wrong with someone like me.

Something offensive,
something you would avoid,
maybe even pity.

S01E07

⁴ “Sense8” (2015). <https://www.jwz.org/blog/2015/06/sense8/>

Bug - OK. Let's start you off with some switch hooks.
 Nomi - I need a candygram and a feedthrough
 that'll burrow through any firewall ever built. (...)
 And how about a waterwitch?
 Bug - No, but I do have...
 Nomi - A Ragemaster? That's NSA grade.

3.4 Note

While it is unclear to us what “switch hooks” or even “feedthrough(s)” are supposed to be, the **candygram**, **waterwitch** and **ragemaster** are all real, existing devices used by the NSA and its so-called ‘Tailored Access Operations’ (TAO) – among many others of likewise denomination.

The Candygram for instance “[m]imics GSM cell tower of a target network.” according to a leaked NSA catalog. “Unit Cost: approx \$40K”.⁵⁶⁷

Figure 6: Chaos Computer Club’s 2013 Congress, presentation J. Applebaum.

4 Misc.

Serial Experiments Lain (1998), *Cowboy Bebop* (1998-1999)⁸ ...

⁵ “NSA ANT catalog”. https://en.wikipedia.org/wiki/NSA_ANT_catalog

⁶ Schneier, Bruce. 2014. “CANDYGRAM: NSA Exploit of the Day”. 20/02. https://www.schneier.com/blog/archives/2014/02/candygram_nsa_e.html

⁷ Applebaum, Jacob. 2013. “To Protect and Infect”. 30C3, 30/12. b0w36GAyZIA

⁸ Source front illustration : Ed (he/she/they/*).

The popular culture of computer scientists : No beginnings and no endings.

Camille Akmut

July 24, 2019

Abstract

Part 3 of 3 covers manga, anime and video games; But, this was never about popular culture...

Foreword

No mere ‘cultural history’, of doubtful use or importance¹, in this paper we continue investigations of the subconscious of scientists in the tradition of Bachelard and other leading historians of science.

This exceptional philosopher-historian of a background in mathematics had given their imagination and dreams a central role : highlighting them as integral parts of their scientific activities and endeavors, along with all the other parts of their lives that were either dismissed or underestimated; demonstrating their implications even onto their works themselves.

“*The popular culture of computer scientists*” : a title of two meanings², a project kept last.

In many places of this history, we found mirrors showing towards others, creating endless reflections of one culture influencing, contrasting, inspiring, contradicting the other; such that there remained seemingly no beginnings and no endings.

In the alternative futures variously imagined in these works of fiction, computer scientists have roles – and powers – increasingly akin to that of doctors, psychiatrists, psychologists and legal experts : of the new body, and the new mind.

Such is their great responsibility, now and even more to come.

There, the hardware and software they fashioned and created became part of us – *inside*.

Algorithms, systems, circuits, routines, cryptographies hopefully strong enough to guard the secrets of minds and hearts, the integrity of values and beliefs, the accuracy and faithfulness of memories, and vision.

But, this was never about popular culture.

“I think I owe you an apology.
I’ve been lying here, thinking.
Your quest. It should have been mine.
If I die now I die in vain.
I have nothing to show for myself.
My life...
I can see now that I always played it safe.
I wouldn’t take sides.”³

In various classical texts there would have been a place for Skinner.
Those who remember *Inferno*’s beginning know :

“*undecided stood but for themselves.*”⁴

¹Product of foolish historians who make use of their offices and profession as playground for the satisfaction of their own little, personal pleasures.

²*Their* popular culture, and popular culture (representations) *of them*.

³S06E09.

⁴Canto III (“in their (...) lives had no banner, (...) now run forever after one.”).

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1 Manga : *Ghost in the Shell* (1989)

Notable for the importance attributed to philosophical themes, around the status of life, human nature and rights – the old, large questions found here new insights.

These discussions happen around at least three (central) subjects :

- an AI turned life-form (i.e. Project 2051/‘*The Puppeteer*’)
- cyborgs (e.g. protagonist Motoko)
- (intelligent) robots (e.g./i.e. Fuchikoma)

1.1 Project 2051/‘*The Puppeteer*’

Figure 1: Project 2051/‘*The Puppeteer*’ in *Ghost in the Shell* (ch. 12).

Figure 2: “I am not an AI.” (ch. 12).

Ch. 12 in particular establishes the true nature of Project 2051/‘*The Puppeteer*’; unlike first thought.

Preceding this, Motoko asked – if it is more than a robot; and, – if so what its nature is.

Figure 3: One of the first pages of ch. 12.

Project 2051/‘*The Puppeteer*’ is subject of two assumptions at least :
 – an “*enemy*” (“*our enemy*”) (‘terrorist’, ‘hacker’...)
 – a robot, but revealed to be “*self-aware*” having evolved and elevated itself to individual existence, “*life-form*”; specifically “*not an AI*”.

Project 2051 (‘*The Puppeteer*’) ascerts this in multiple acts : they

1. declare they are aware of their own existence (a ‘Cogito, ergo sum’)
2. claim rights; and facing opposition
3. assert and argue their nature beyond that of an artificial intelligence (having “spontaneously” originated from their environment, and as such not so different from our current understanding of the origins of human life).

1.2 Cyborgs (human + machine)

Cyborgs are the focus of ch. 5 : though present since the beginning, they are given here a formal definition, description.

“A cyborg refers to a human whose body has been partially or almost completely altered by the use of substitute artificial organs and parts.”

Figure 4: A (female) cyborg.

In the comic book (manga), the illustration shown in figure 4 is accompanied by a description that further states :

*“The female cyborg suspended from the ceiling in the illustration (...) is over ninety percent machine.
The only part of her original flesh-and-blood body that remains is her brain and spinal cord, and that, as the illustration shows, is inside a special shell.”*

Questions around their status were omnipresent, in particular where protagonist Major Motoko Kusanagi was concerned, a cyborg themselves.

We avoid gendered uses of language on purpose as this issue too was an object of concern and debate throughout.

Figure 5: The famous lesbian (cyber) sex scene in ch. 3.

1.3 Fuchikoma (Single AI robots)

Fuchikoma are the central topic of ch. 4 entitled “*Revolt of the Robots*”.

“The robots collectively referred to as “Fuchikoma” are a single “AI” (artificial intelligence).”

and further :

“Fuchikoma units have different experiences resulting in individual differences. [But] at night, or after a job is completed all units have their memories (...) unified.”

During this event, they realize their condition and organize a revolt.⁵

Figure 6: Revolt of the Fuchikoma (ch. 4).

1.3.1 Note : Fuchikoma and Tachikoma

In Masamune Shirow's *Ghost in the Shell* manga they were named "*Fuchikoma*".

Figure 7: Fuchikoma design in *Ghost in the Shell* (ch. 2).

They were later re-named and re-designed as "*Tachikoma*" for adaption purposes due to copyright reasons, and are now better known as such

⁵In terms that remind of those of *The Communist Manifesto*.

seemingly.⁶

In the first adaptation into a series, *Stand Alone Complex* (2002-2003), they thus appeared as “*Tachikoma*” (based on designs by Shirow).⁷

Figure 8: Tachikoma in *Stand Alone Complex* (ep. 15).

In *Snatcher* (1988), created by Hideo Kojima, assistant robots were ‘metal gear’. Was this a possible inspiration?⁸

Figure 9: ‘metal gear’ in *Snatcher*.

⁶Fuchikoma were completely left out from the 1995 film adaptation (we can only assume copyright was the reason bare artistic choices).

⁷Ch. 4 is a full episode in ep. 15 “Time of the Machines MACHINE DESIRANTES”.

⁸This should probably not be given too much importance in general; specifically here as robot designs have a long tradition within this medium, and are in fact constituent of an entire genre or sub-genre (“mecha”).

2 Anime : *Ghost in the Shell* (1995)

Mamoru Oshii achieved with his adaptation of *Ghost in the Shell* a philosophical discussion of its themes better and greater than many other; this includes the original arguably.⁹¹⁰

3 scenes in particular stand out : (in order of appearance)

- 1. what may be named : ‘the boat talk’, and accompanying it the ‘simulated experience’ passage
- 2. ‘the declaration of rights’ for artificial intelligence (c. 00h45m)
- 3. ‘the merger’ of consciousnesses (at the end).

Figure 10: ‘simulated experience’, and ‘diving’ and ‘boat’ scenes.

The boat talk (c. 00h28m/00h30m) has for true beginning the scene immediately preceding it, the case of ‘a “simulated experience”’ (c. 00h26m-00h28m), where it finds its motivation.

B - "That's all it is. Information. (...) all the information that a person accumulates in a lifetime..."

⁹A decade before *Ghost in the Shell*, Oshii had already distinguished himself as a great director/filmmaker with *Angel's Egg* (1985).

¹⁰We forgo here discussions of its exceptional status (large budget, commercial success, and importance for bringing the anime genre to wide audiences), found already in books.

As did banquets for the philosophers of Ancient Greece, this setting – due to its isolation, the intimacy created around two individuals – is backdrop for philosophical discussions around the greater reason of things.

It starts with Batou asking why a cyborg would go diving in her (their) spare time.

B. - "What if the floaters don't work, or something else fails?"
M. - "I'll die then." - "Or, maybe you'd save me."

Beyond whatever general meanings this could be attributed, it also arises from the specifics of the cyborg body :

"Confinement?! That's why you gamble swimming with a body that can sink like a rock?"
as Batou later interjects in this conversation, dialogue.

Figure 11: The 'boat talk'.

A definition of conscience (consciousness), humanity and mind comes from Motoko in the following form :

"There are countless ingredients that make up the human body and mind.
Like all the components that make up 'me' as an individual with my own personality.

Sure I have a face and voice to distinguish myself from others,
but my thoughts and memories are unique only to me,
and I carry a sense of my own destiny.
(...)
I collect information to use in my own way.

All of that blends to create a mixture that forms me,
and gives rise to my conscience."

This seems to be at least partially an answer to Batou's earlier remarks, prompted by the 'simulated experience' interrogation.¹¹

¹¹Though it is unclear exactly who (and whose voice, or 'ghost') speaks here. (Various noticeable musical cues and framing choices accompany this statement.)

Figure 12: A declaration of rights.

They¹² are introduced as “the most extraordinary hacker in the history of cyber crime”¹³.

They are referred to as “he” and “him”, creating confusion with one of the men initially, presumably due to their exterior appearance.¹⁴

“The Doctor is referring to the original pattern (...) that’s now in the body.” – responds the other.

But, nothing comes close to the shock created for all when they declare (like in the original source material though not identically) :

“As a sentient life-form, I hereby demand political asylum.”

¹²In this film adaptation ‘The Puppeteer’ was alternatively called “*The Puppet Master*”.

¹³“... of cyber-brain crime.” in the manga.

¹⁴Note : they are all men.

Figure 13: Dr. Willis (center).

If classical rules of iconography or symmetry are followed, Dr. Willis is the central figure among the men.

Left and right of him are two powerful men : one Mr. Nakamura (from the Foreign Ministry) and Aramaki, who heads Section 9.

Also among them (to the far edge) is a technician or engineer (dressed in red), nameless.

The exact identity of Dr. Willis remains unknown here.

Figure 14: Ishikawa : “*I’ve been divin’ around...*”.

It is only thanks to the work of a security expert, engineer of some sort (named Ishikawa) that we learn the identity of this nebulous character.

Dr. Willis is the head of this project as well as many other things; as individuals like him tend to be.

Ishikawa - I've been divin' around in the Ministry of Foreign Affairs net.

Aramaki - Wait, I'll switch to an encrypted channel.

Ishikawa - Okay now? (...) scoop on that guy who showed up with Nakamura.

He's an American : Dr. Willis.

Head of Strategic Research at Neutron Company.

A top researcher in the field of artificial intelligence.

Information that helps make sense of his doings in the previous scene, where his machine parts were additionally exposed (cyborg, robot or else, we don't know).

Figure 15: Dr. Willis enters code.

Considering the original aims of the Project (political manipulation), this choice of a computer scientist is fit considering the history of the field of artificial intelligence with regards to (dubious) affiliations¹⁵.

¹⁵With the private sector among others – which we have pointed out elsewhere. E.g. Hinton (Google), LeCun (Facebook, VP and Chief AI Scientist), Karpathy (Tesla) – and the rest of this peculiar crowd.

3 Computing and society in video games

The years from 1993 to 1995 represented some golden moment for video games where themes relating to computing and society were concerned : *Shadowrun* (1993), *Beneath a Steel Sky* (1994), *System Shock* (1994) and the Western version of *Snatcher* (1994 EU; 1995 NA) being released in close succession of each other.

They all had been preceded by *Snatcher* in 1988.

In the search for antecedents – an endless and almost futile quest – we included *Metroid*, with reservations.

We concentrated on the earliest such cultural products.

They had for (often common) themes :

- the merger of humans and machines (variously called “*cyborgs*” or “*androids*” or some other *-roid* nomenclature)
- a fundamental re-examination of gender and sex (based on these changes)
- artificial intelligence and robotics
- very large companies and governments

Many, no doubt, have since appeared (and will appear) with the same themes and preoccupations.

3.1 Metroid (1986)

Metroid, a platform (‘jump and run’) game, had story and themes that comparatively drew more from space epics (opposed by cyberpunk)¹⁶.

“*fortress planet*”, “*galaxy federal police*”, background of stars, etc.

Figure 16: The entire script for 99% of *Metroid* (1986).

¹⁶e.g. Asimov and Herbert in literature, *Star Wars* and *Star Trek* in cinema. Although *Metroid* itself seemed to draw more from *Alien* (1979) specifically.

Figure 17: Box of *Metroid* (C 1987 Nintendo America).

Protagonist Samus Aran has body enhancements (in the form of an armor or rather “*spacesuit*”, and weapons).
 Their gender is object of mystery.

Figure 18: Samus (she/they/he/*) at the beginning and end of *Metroid*.

3.2 Snatcher (1988/1994)

“This story is dedicated to all those cyberpunks who fight against injustice and corruption every day of their lives.” — epitaph

Author Hideo Kojima¹⁷¹⁸ created with *Snatcher*, published 1988¹⁹, what is likely the first, most ambitious and mature project of its kind, a video game – a “*cyberpunk adventure*” (as its cover stated) – that contained the themes explored in literature and film in the decades before:

“[S]cience fiction dealing with future urban societies dominated by computer technology.”, according to one definition of cyberpunk.²⁰

Examples of which range from novels like Philip K. Dick’s *Do Androids Dream of Electric Sheep?* (1968) to movies like *Blade Runner* (1982), adapted from the former, through Gibson’s short story “Hologram Rose” (1977) and later novel *Neuromancer* (1984).

—
Androids are responsible for “*humanity’s greatest crisis*”;

a “*life form*”, “*part organic, part machine*”.

“*[T]hey can sweat and even bleed*” (dotted with an “*artificial skin*”).

“*They are almost indistinguishable from*” humans.

Figure 19: An android in *Snatcher*.

These androids are called “*snatcher(s)*” because of their “*killing humans and taking their place*”.

“*Its purpose and origin are unknown*” – the (voice-over) introduction continues.

In Dec. 2047²¹ new Kobe (“*Neo Kobe City*”), protagonist Gillian Seed

¹⁷Best known for the acclaimed *Metal Gear* series.

¹⁸He is credited as “*creator*” in the English-language version.

¹⁹A Western version appeared in 1994.

²⁰<https://www.merriam-webster.com/dictionary/cyberpunk>

²¹This narrative choice, of December or Christmas, is shared with e.g. *12 Monkeys* (1995).

becomes a new member of JUNKER²², “a special task force put together to combat the ‘bioroid SNATCHER’ menace”, “overseen by government intelligence agencies”.

To help him he is given a robot : ‘metal gear’ (a ‘personal assistant’).

A member of this group/organization is named Gibson.

A quest to regain “lost memories” and “to remember [the] past.” (“our past”).

Figure 20: Opening scenes of *Snatcher*.

²²Pronounced junk-er. (A likely poor choice in translation/localization considering the (historical) meanings of this word.)

Figure 21: (Further into) *Snatcher*.

3.3 From *Shadowrun* to *System Shock*

Figure 22: *Beneath a Steel Sky* (1994).

In *Beneath a Steel Sky*, a British production²³, a (central) system called LINC forms society's backbone.

²³Fact exceptional enough to be noted in an industry (historically) dominated by Japanese and U.S.-American companies.

Its ending sees the protagonist ask, and receive for answer :

- You're not HUMAN, are you?
- Now WHATEVER gave you that idea?
I'm OBVIOUSLY not a MACHINE...
Or an ANIMAL...

And, that this technology and whatever plans their makers may have are “*for the well-being of the human race.*” (announcing simultaneously otherwise). An Oppenheimer-like figure.

(b) New Atlanta

Figure 23: *Shadowrun* and *System Shock*.

Shadowrun opened with the following introduction²⁴ :

THE YEAR IS 2050

And the megaplexes are monsters casting long shadows.

When you become a shadowrunner, that's where you live...
in the cracks between the giant corporate structures.

The megacorps are powerful in a time when power means information...
...computer information flowing in the global network called the MATRIX.

Here, not governments, but large companies – called “*megacorps*” – are presented as the biggest threat (to humanity).

This contrasts with contemporary debates, which lead by few but influential individuals and institutions (of Libertarian backgrounds mostly²⁵),

²⁴Note this game was released half a decade before *The Matrix*.

²⁵Followed by anarchists.

make governments often the primary, central or sole adversary of human rights, in particular privacy.

A semi-famous computer science PhD thesis published at the turn of the millennium had for dedication :

“To my parents, advisors, and colleagues, for pushing me to finish this thesis.

And to the US Government, for at least keeping things interesting.” (p. 1)

In many more passages, its author goes on about “the government” (with a capital G),

“Government is one of the biggest consumers and producers of dossiers of personal information” (p. 15)

but he never seemed to have considered companies.

In that, he is not alone and representative of a certain class of computer scientists and technologists (primarily from the United States).

Figure 24: A random graffiti in Berkeley, California.

Libertarianism and anarchism : two faces of the same coin.

To the ideology of the father, corresponds that of the son; and to that of the bourgeois wife her former rebellious self.

In the end, all are faithful to their class of origin.

The popular culture of computer scientists... :
addendum — the future past.

Camille Akmut

July 30, 2019

Abstract

The remaining X-Files : including one episode about an NSA whistleblower and one about a modern Oppenheimer or Midas.

Foreword

One of the great pleasures – few in an otherwise difficult task – derived from looking into the past is discovering hidden within it mirrors of our own days; but, painful too because simultaneously reflection of ourselves.

—

In this last addition to our study on representations of computer scientists we complete our review of *The X-Files* interrupted mid-way through only to create space for newer, less established media; and to give them the attention they deserve.

One of the last episodes entitled “*Trust No 1*” in particular strikes as prescient and of particular relevance to our contemporary times : there an NSA whistleblower tried to expose “*crimes against innocent people*”. (Broadcast January 2002.)

In another, a US Census Bureau employee does the same : “*Fight the Future*”.

Figure 1: “Theoretical” scientist (*The X-Files*).

In another yet, a scientist makes assurances : “*Our work here is all theoretical.*”, he says – parrot to many current-day computer scientists.

He promises “indestructible things”; like his peers he lacks a proper education, and has not heard of the tale of Midas, who wanted to make everything gold, only to learn through dire experiences the consequences of his ideals, acts. “*Smart metals*” there, “smart homes” here.

—

The latest Turing Award was given to LeCun and Hinton – we have just learned. If the jury of this prize had agreed to pick the worst candidates possible, they would have come up with these same names.

What an upside-down culture!

Its members not only clueless of who they are, but more importantly who they could be. Or, maybe they “just didn’t care” ...

1 *The X-Files* (1993-2002)

1.1 Selected episodes

S08E09 (“Salvage”)	“purely theoretical” scientists with not-so theoretical results.
S08E16 (“Three Words”)	US Census Bureau whistleblower. (Lone gunmen re-unite with Mulder post-disappearance.)
S09E06 (“Trust No 1”)	NSA whistleblower.

1.2 Selected excerpts

S08E09

(a) The more conservative, respectable architecture preferred by some technology companies.

(b) Company logo.

Figure 2: Chamber Technologies in *The X-Files*.

Figure 3: “smart” metals (l.) / computer program (r.).

Dr Puvogel - They're called "smart metals".
The idea is to one day build things that are indestructible.
Cars, equipment... Built of alloys with molecular memory.

(...)

Doggett - An employee number on the document was assigned to a Dr David Clifton.

Dr Puvogel - Uh, Dr Clifton's no longer here.

Doggett - What happened to him?

Dr Puvogel - He left the company.

(...)

Dr Puvogel - I don't deal with materials. Nor did Dr Clifton for that matter.
Our work here is ALL theoretical.

Figure 4: (computer) scientist under arrest.

Dr Puvogel - What's going on here?
It's not enough that my life's been threatened.
I'm being treated like a criminal.
Scully - And, not without cause.

S08E16

Scully - The Gunmen were able to decrypt the data that you found on Howard Salt's hard drive.
It was a series of file directories that were downloaded the day that he died.
Mulder - Downloaded from where?
Langly - The FSC: the Federal Statistics Center.
Byers - A government information bank used by the US Census Bureau where your Mr. Salt worked.

Figure 5: Howard Salt (above) / Federal Statistics Center (below).

Langly - And, even if you have a passcode, you still have to break into the FSC just to use it.
 (...)

Mulder - Well, just remember boys : this is America.
 Just because you get more votes, doesn't mean you win.

S09E06

Reyes - He says he has highly classified military files.

(...)

- I work for the National Security Agency.
 The name on my driver's license is false.
 If you were to call the police, I would be detained only long enough
 for another NSA agent to authorize my release.
 I don't exist as a citizen, nor does anyone I work with.

(...)

Doggett - How do you know anything about her (...)?
 - I know virtually everything about you.
 And you.
 And you.

(...)

Reyes - So you've been looking in this apartment with what? Cameras?

- Various forms of technology.

(...)

- My scope is limited.

I only look at what they tell me to. (...) But I have a supervisor (...)

Figure 6: (unmarked) NSA building – as depicted in *The X-Files*.

(...)
 Doggett - I ran a trace. (...) [but] got a node.
 Sector of six city blocks.
 Area's vacant except for this building.

Figure 7: Internet cafe where the NSA agent(s) first appeared.

Figure 8: Scully closing shades (l.) / on the phone with NSA supervisor (r.).

NSA agent - They're watching.
 Doggett - They're watching?
 [Scully covers the windows.]

(...)

[*disguised voice]

NSA supervisor* - As my associate indiscreetly told you, we don't have names.

Scully - You've been listening to us?

NSA supervisor - It's all I could do after you closed the shades. Agent Scully.

Scully - You ever heard of the Constitution?

(...)
 Scully - What have they done?
 NSA supervisor - It's what they're prepared to do next.

(...)
 Scully - Tell me. I don't know how to reach him.
 NSA supervisor - But, you reached him yesterday.
 You sent him an e-mail. Would you like me to read it to you?
 Scully - Why should I trust you?

(...)
 Scully - We're in the middle of nowhere!
 NSA supervisor - There is no "middle of nowhere" any more.

(...)
 NSA supervisor - Your watch. Give it to me.
 Scully - This is ridiculous. This has gone far enough.

[She consents, he checks the watch, then gives it back to her.]

(...)
 NSA supervisor - Your size? I know your blood type, your resting heart rate,
 your childhood (...)
 I know the name of your college boyfriend, your true hair color, your ATM PIN number.
 Favorite charities, pet peeves.
 I know you spend too much time alone. And, I know that on one lonely night ...

Figure 9: Face-to-face meeting with NSA supervisor (*The X-Files*).

(...)
 NSA supervisor - I was as surprised as you are.
 Scully - Who authorizes you? I mean, what gives you the right? Who are you?!
 NSA supervisor - I'm the future

Figure 10: NSA agent spray painting over camera (*The X-Files*).

1.3 Notes

— In episode S08E16, as far as we know multiple invalid IP addresses (e.g. 320.xxx and 257.xxx) were displayed.

Character Langly commented “*I can’t get it uploaded, let alone start transmission*” (naively), while Mulder had just been shown successfully downloading from/to them; but both should be impossible in our current system, at least (range 0 - 255).

Figure 11: Mulder (left) / Langly (right) in S08E16.

— In episode S09E06, we characterized the (NSA) building shown in figure 6 as “unmarked” :

For real such buildings, see the *The Intercept*’s exemplary article “The NSA’s Hidden Spy Hubs in Eight U.S. Cities”.

— In the same episode, Mulder uses the e-mail address : `trust_no1@mail.com`.

The whistleblower insists on communicating with Mulder alone / only (by then quite well-known, if not public figure).

No visible form of encryption is used between Scully and Mulder.

PGP blues – a quick review of a computer science malaise.

Camille Akmut

August 7, 2019

Abstract

Bibliography with accompanying material : important debates around PGP, its purported failings as well as newer protocols such as OTR and Signal.

Intro

“– *This is ridiculous. This has gone far enough. (...)*
We’re in the middle of nowhere!
– *There is no ‘middle of nowhere’ any more.*”

Hard to use, hard to understand¹, ‘[horror] museum’ even! –

PGP has no shortage of critics, under continuous assault now for about two decades.

Its detractors emphasize perfect forward secrecy and deniability, among others.

This publication aims to provide an entry point into these discussions.

It makes available a bibliography together with excerpts, notes and a timeline.

In various places, terms such as “*future secrecy*” or “*post-compromise security*” are found instead of forward secrecy, for example²; in others “*backtracking resistance*” is used still instead³!

Elsewhere, we are assured that “*asymmetric cryptography*” has long replaced the outdated category of “*public-key cryptography*”⁴, though doubts remain as to whether this represents a true consensus...

—
These computer scientists seemingly cannot agree on a common terminology, and have yet to do so. Their science, a young one...

These are some of the great debates of our times.

¹The two former points are mentioned by Ian Goldberg for instance, as general challenges of cryptography research, and properties of cryptographic systems, first. Soon the main target however becomes obvious : PGP! (See Goldberg 2007.)

²They refer to the same property, as far as is known to us.

³*Serious Cryptography*.

⁴“Over time terminology has shifted: now public key cryptography is mostly called “asymmetric cryptography” and public keys are more often called “public certificates”” (Hansen 2019).

From PGP to OTRv4 (1991-2019)

*1991 : Introduction of PGP (Phil Zimmermann). Proprietary.

*1997 : Introduction of GPG (Werner Koch). Free software.

— Koch, Werner. 2007. “A Short History of the GNU Privacy Guard”.

“It’s been a decade now that the very first version of the GNU Privacy Guard has been released. This very first version was not yet known under the name of GnuPG but dubbed “g10” as a reference on the German constitution article on freedom of telecommunication (Grundgesetz Artikel 10) and as a pun on the G-10 law which allows the secret services to bypass these constitutional guaranteed freedoms.

Version 0.0.0 released on December 20th 1997, was a barely working replacement of PGP avoiding all patented algorithm by using Elgamal and Blowfish instead of RSA and IDEA.”

*2004 : Introduction of OTR (Nikita Borisov, Eric Brewer, Ian Goldberg).

— Borisov, Nikita, Brewer, Eric and Goldberg, Ian. 2004. “Off-the-Record Communication, or, Why Not To Use PGP”.

“Quite often on the Internet, cryptography is used to protect private, personal communications. However, most commonly, systems such as PGP are used, which use long-lived encryption keys (subject to compromise) for confidentiality, and digital signatures (which provide strong, and in some jurisdictions, legal, proof of authorship) for authenticity.

In this paper, we argue that most social communications online should have just the opposite of the above two properties; namely, they should have *perfect forward secrecy* and *repudiability*. We present a protocol for secure online communication, called “off-the-record messaging”, which has properties better-suited for casual conversation than do systems like PGP or S/MIME. We also present an implementation of off-the-record messaging as a plugin to the Linux GAIM instant messaging client. Finally, we discuss how to achieve similar privacy for high-latency communications such as email.”

— Goldberg, Ian. 2007. “Off-the-Record Messaging: Useful Security and Privacy for IM”.

*2013/14 (?) : Introduction of Signal as TextSecure (Trevor Perrin, Moxie Marlinspike).

“The TextSecure encrypted messaging protocol is derivative of OTR Messaging. The major difference being the use of ECC keys instead of standard DSA (...)”⁵

— Marlinspike, Moxie. 2014. “GPG And Me”.

“There just seems to be something particular about people who try GPG and conclude that its a realistic path to introducing private communication in their lives for casual correspondence with strangers.”

— Green, Matthew. 2014. “What’s the matter with PGP?”.

“a museum of 1990s crypto”

Note : https://en.wikipedia.org/wiki/Matthew_D._Green

*2015 : *ProPublica* article reveals “one guy” is working on GPG, and that person – Werner Koch – is “going broke”. To wide schock.

— Walfield, Neal. 2016. “Op-ed: Why I’m not giving up on PGP”.

“Signal can’t replace PGP.”

⁵Presumably elliptic curve cryptography and Digital Signature Algorithm respectively.

Note : Walfield is a former GPG contributor, currently working on a new OpenPGP implementation called Sequoia (in Rust).

— Cohn-Gordon et al.. 2016. “A Formal Security Analysis of the Signal Messaging Protocol”.

“The Signal protocol is a cryptographic messaging protocol that provides end-to-end encryption for instant messaging in WhatsApp, Wire, and Facebook Messenger among many others, serving well over 1 billion active users. Signal includes several uncommon security properties (such as “future secrecy” or “post-compromise security”), enabled by a novel technique called *ratcheting* in which session keys are updated with every message sent. (...)

We conduct a formal security analysis of Signal’s initial extended triple Diffie-Hellman (X3DH) key agreement and Double Ratchet protocols as a multi-stage authenticated key exchange protocol. (...)

We have found no major flaws in the design (...) of this widely adopted protocol. (...)

In this work we provided the first formal security analysis of the cryptographic core of the Signal protocol.”

— Bini, Ola and Celi, Sofia. 2018. “No evidence of communication: Off-The-Record Protocol version 4”.

“the 4th version of the OTR protocol provides stronger deniability than all current secure messaging protocols in use, such as OTRv3 and Signal. (...)

the purpose of OTRv4 is to provide an up-to-date protocol that provides no convincing cryptographic evidence that a conversation took place. (...) To achieve this property -known as forgeability- we use XSalsa20”

— Gillmor, Daniel. 2019. “OpenPGP Certificate Flooding”.

“My public cryptographic identity has been spammed to the point where it is unusable in standard workflows.”

Note : Debian contributor, ACLU technologist.

— Hansen, Robert. 2019. “SKS Keyserver Network Under Attack”.

“In the last week of June 2019 unknown actors deployed a certificate spamming attack against two high-profile contributors in the OpenPGP community ([self] and Daniel Kahn Gillmor”

Note : GPG contributor.

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(in order of appearance)

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- <https://dkg.fifthhorseman.net/blog/openpgp-certificate-flooding.html>
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The History and Sociology of Computer Science and Technology **II**.

Camille Akmut

January 25, 2022

A second historiography series is started with the goal of producing an irreverent, hopefully useful review of available references. We call this new, stimulating field the history and sociology of computer science and, (therefrom derived), technology but do not forget the historical if not current role of philosophy.

MONOGRAPHS

— Heidegger, Martin. *Holzwege* / “The Question Concerning Technology”, in English.

Lederhosen and Stoffhut ready, Heidegger manages to do both less than Marx (“*technology cannot be destroyed*”) and Plato (his societal ideal of a philosopher king), leaving the contemporary researcher to contemplate what all the excitement was about. In his essay on Nietzsche, H. goes hardcore bucolic “*Before the plowing comes the sowing*” by which he means that the philosopher is the plower/slash/designer of knowledge, leaving to the dirty peasants of the city (mathematicians, social scientists, etc.) the successive task of sowing their “*fields*”, with their little facts... One can, however, derive why the black boots might have enjoyed this. I can already hear the birds singing, and the crystal river water flowing.

— Davis, Martin. 1958. *Computability and Unsolvability*

Classic textbook produced and used during the infancy of computer science, for the corresponding (traditionally upper level) class – including by a young Donald Knuth.

— Davis, Martin. Var.. *The Universal Computer / Engines of Logic* [paperback]

The other book by Davis : a fairly straightforward history from Leibniz to Turing (Pascal was never forgiven his religious tendencies).

— Galloway, Alexander. 1994. *Protocol: How Control Exists After Decentralization*.

In a highly uncertain scholarly market, this work appears to be a serious attempt at a technologically-informed philosophy of technology.

PAPERS

— NBER. “Blockchain Analysis of the Bitcoin Market”. nber.org/papers/w29396

Among their findings are iconoclast statements such as :

“90% of transaction volume on the Bitcoin blockchain is not tied to economically meaningful activities”,
and furthermore “*0.1% (about 50 miners) control close to 50% of mining capacity*”; essentially breaking with the long suspect myth of cryptocurrencies, as in the case of Bitcoin, bringing any “disruption” let alone “revolution” of banking. In fact, the image that emerges from this research is that such financial technologies reproduce the well known, well established, long studied inequalities and concentrations of wealth and power already found in the old world.

POP CULTURE : FILMS, NOVELS...

— *Sense8*

An underrated National Geographics episode (“From Kenya to Reykjavik”).

— *Matrix 4* (2021)

Everyone is a black lesbian resistance fighter, the baddies are white men (what else!), robots are actually cool (cybebe), and the fascists are smashed, and a rainbow shines at the end. Gosh, this is grand cinema. Forget Vigo, folks.

— *Attack surface* (2020)

Girlboss ~~Karen~~, ~~Frances Haugen~~, ~~Elizabeth Holmes~~ Masha made some serious \$\$\$ (at not Google) but now has regrets. Oh, no... Vague anticommunism meets hollow Bush critique meets all the liberal tropes of the middle-aged liberal. Actually, it was her husband’s fault – which will be the next installment in the series.

— *Wings of Honneamise* (1987)

"Just speak in the vernacular, be yourself!" In this alternate universe (with distinct number-measurement system), space becomes available to humanity, but benevolent exploration and military and political exploitation soon become intertwined. Compatible with a Marxist view, the new technologies of this society lead to both personal tragedy (the destruction of a house for the benefit of energy production?) and social instability and labor fights. The movie that put Gainax on the map (see also "Otaku no video" for the phenomenon of extreme isolation of youths within capitalism, gathered around specific hobbies e.g. videos, war, pornography etc., themselves fairly commercial.)

— *Good Will Hunting* (1997)

The famous problem is from graph theory (one of the few areas of mathematics where a non-expert could somewhat realistically make contributions due to its intuitive nature), and appears to be a typical homomorphism problem, with extra conditions added to it (but essentially, the background question remains, "are these the same?")

— Lee, Spike. 2021. *The Currency of Currency*. Ad for Coin-Cloud.

Cryptocurrencies are "inclusive", "fluid", "culturally rich" and inherently black-brown and female (implied).

Figure 1: Black capitalism (variant).

GENERAL SOCIAL SCIENCE

— Frazier, Franklin. *Black Bourgeoisie*.

"[I]t was not until after Emancipation that the spirit of modern business enterprise really took root among the Negro elite. Frazier highlights the early, formative experiences around the Freedmen's Bank – which failed, but led way to many, new

experiments, mostly banking projects in the "cities of the South" [ch. 1 The roots of the black bourgeoisie]. Ends with an absolute condemnation :

The black bourgeoisie suffers from "nothingness" because when Negroes attain middle-class status, their lives generally lose both content and significance.

— Reed, Adolph. 2021. "Why Black Lives Matter Can't be Co-opted". *Nonsite*, 23/07

BLM can't be recuperated : Behind this clever title, on which everyone at least will agree, lies nonetheless the inconvenient truth that something that has no substance cannot be recuperated... ["nominally left, but who can tell what that means anymore?"]

NEWSPAPER ARTICLES

— "Architect behind Googleplex now says it's dangerous...", *NPR* 22/01.

The architect of Google's headquarters says it is dangerous because it blurs the line between work and non-work time, binding workers for as long as possible by offering them various on site services (the limit of which being the capitalist's ultimate dream of a worker available 24/7, or total surplus value extraction).

— "Former Google CEO invests in computing help for university scientists. Schmidt Futures philanthropy launches [blabla]" *Science*, 18/01.

Here, "*homemade computer software written by students and postdocs*" (read : community, free software) is opposed to "*robust, flexible, and scalable software*" (corporate-controlled open source, cloud...).

OK, thanks Schmidt. This is definitely subtle reporting, and not advertisement at all, because not only is the journalist qualified but is also not adverse to risk taking and a hard-boiled life.

— "Le pillage de la communaute des logiciels libres" [The pillaging of the free software community]. *Le Monde Diplomatique*, January issue.

Published, in the tradition of free culture, as a paywalled article :

Mgr. Zacchiroli, who, in addition to having been a Director of the Open Source Initiative (i.e. the main think tank historically responsible for the dilution and even dismantlement of the original free software principles) also was one of the principal signatories of a letter calling for the social death of the founder of free software, now earnestly wonders why free software is weak and was co-opted or recuperated. Were some too power hungry, or is that businesses were too powerful, or perhaps an unlucky convergence of both?

Such is the tragedy of Monsieur Zacchiroli : yesterday far away, long forgotten, his repeated errors in judgment bring him eternal source material for new "research", and prompt thought pieces in the local press...

Figure 2: Glenn Greenwald during his "crypto" period.

The History and Sociology of Computer Science and Technology II (cont.).

Camille Akmut

January 26, 2022

A second historiography series was started and is now continued, with the same goal of encouraging prospective research.

REPORTS AND PAPERS

Cryptography is one of the disciplines of computer science that has strong elements of a social science, as it regularly stumbles against “human trust”, and “human errors” (sometimes abstracted as “operator” or “user” or else), which it cannot quite solve. Its ultimate goal seems to be the construction of *trustworthy yet trust-less systems*!

— Shannon, C.. 1949 [1946 classified]. *Communication Theory of Secrecy Systems*. circa 60 pages.

In this work, pioneer Claude Shannon uses the term “Secrecy Systems” either entirely, or almost synonymously with “cryptography”; and, this might perhaps be a better designation for that discipline. He explains (ahead of his time) :

”The treatment is limited to the case of discrete information where the message to be enciphered consists of a sequence of discrete symbols, each chosen from a finite set. These symbols may be letters in a language, words of a language, amplitude levels of a “quantized” speech or video signal, etc. (...)”

— Shamir, A.. 1979. “How to Share a Secret”. *Communications of the ACM* 22(11) : 612-613.

Here, Shamir pushes his discipline into the modern era by providing a solution to secret sharing that allows for either involuntary or voluntary leaks, just as well as a very liberal amount of errors or mistakes (under conditions, specified).

”we show how to divide data D into n pieces in such a way that D is easily reconstructable from any k pieces, but even complete knowledge of $k - 1$ pieces reveals absolutely no information about D . This technique enables the construction of robust key management schemes for cryptographic systems that can function securely and reliably even when misfortunes destroy half the pieces and security breaches expose all but one of the remaining pieces.”

— Atwater, E. and Goldberg, I.. 2018. “Shatter Secrets: Using Secret Sharing to Cross Borders with Encrypted Devices”. *Security Protocols XXVI* 11286.

The authors try to solve the old question of cryptography : how to get information X from places A to B . Behind this seemingly simple task, however, lies an entire field : Specifically, they concentrate on the scenario where a lawless, or anti-democratic zone (e.g. the United States border) lies between the two points.

Based on the established notion of “secret sharing” (cf. Shamir above, Blakley), which in formal language is expressed as :

”Cryptographic secret sharing schemes take some arbitrary secret data D and divide it into $n \geq 2$ shares”

The n portions, or ‘shares’, of the secret (e.g. password, encryption key, ...) are “*securely transmitted to friends residing at the traveller’s destination*”, such that the traveller is “*technically unable to comply with requests*” to divulge their secret. This recalls the other notion of “plausible deniability”, also found as “deniable encryption” in the lit..

POPULAR CULTURE : VIDEO GAMES, COMICS ETC.

— *Resident evil*. Playstation and var.. Capcom and others.

One of few video games with an anti-capitalist plot : a bio-tech company buys off an entire town, does experiments on animals/humans, creating an infectious disease.

Here's a trick question for only the most ambitious of future computer scientists : Does secret sharing, as implemented on the original Playstation entertainment system Resident evil games, fulfill the conditions of Shamir's famous 1979 paper? Please answer in 2-3 pages, or you will not be able to maintain your 4.0 GPA, be banned from interviewing at Google, and will be reported to MIT Police (even if you are not a student there).

— *Deus Ex* (2000-...). PC and var..

The other well-known anti capitalist plot video game series (being made in the tradition of cyberpunk, science fiction).

* Lebedev: Do you think it's an accident that the cure to the global plague is owned by a single corporation, and that it's kept so secret that only the tabloids dare print a story suggesting that it exists?

* Denton: The supply is limited. That doesn't mean there's a conspiracy.

[...]

* Lebedev: The question you've got to ask - I'm surprised you haven't - is the obvious one. Who am I? Who made me, and for what purpose?

— Hong, Jason. 2022. "Superhero Secret Identities Aren't Possible with Today's Computing Technologies" ACM blog, 24/01.

This computer scientist argues that the secret identities of heroes (they name : Spider-Man, Batman, Superman...) would be impossible today due to the emergence of various surveillance methods (surveillance cameras, so-called "stingrays" that target phones, drones and automatic recognition systems that target protesters etc.).

DOCUMENTARIES, DOCU-FICTION

— *Unabomber: In His Own Words* (2020). c. three hours.

Based around a rare interview of Ted Kaczinski, complimented by a great body of supporting materials (archives, testimonials with family, acquaintances, investigators, reporters, victims...). Should include photos of his library (various chemistry textbooks, among others) and the "Eco-fuckers" list.

— *Manhunt*, season 1: Unabomber (2017...)

Highlights the long path leading to innovative linguistic forensics (used against, interior, State enemies).

MONOGRAPHS AND DEBATES

— *Capital is Dead: Is This Something Worse?* (2019) Verso.

Among the highly volatile world of fashionable ideas (post-*x*, post-*y*, post-media, post-capitalism, or Heideggariano-Deleuzian-Queer-theory), main producers are places such as New York University – in N.Y. – and Goldsmith, in the U.K.. McKenzie Wark at least has impeccable tastes in rock music [she likes Kim Gordon and Patti Smith]. As for the rest,

"If you are getting your media for free, this usually means that you are the product."

Yes. Information has been turned into commodity. Yes. In a great reversal, people provide their labor for free and do so happily/obliviously. O.K..

It feels that some of her ideas have already been expressed a thousand times in blog posts and other ephemeral media that are bound to never be referenced properly nor published, condemned to abandon and silent disappearance. Perhaps this phenomenon, too, ought to be included in the new modes of production brought on by capitalism in the digital context, era.

Her merit is perhaps to have made sure they don't vanish completely.

"I'm deliiiiighted" (Wark 2021)

— Butler, Judith, Greenwald, Glenn and West, Cornel. The *2021 Holberg Debate*. circa 2 hours 40 minutes.

Midway through the exchange Judith Butler notes that, where a debate on identity politics is concerned, a black woman is missing, even though their experiences and/or perspectives would have been invaluable. To this, Glenn Greenwald retorts that together they represent some degree of diversity (a woman, a gay man and black man)

and that by her logic e.g. an Indigenous person is also missing. Butler understands that her system does not entirely work, and upon encountering that bug admits that "formal diversity" is probably an endless endeavor and should be rejected. She opposes to this notion what one could call "real diversity", but a concrete definition remains elusive in the end...

In general, There is no shortage of cannon fodder academics who pretend they have "surpassed" Marx, yet always falling so very short of his ankles, socks, and trousers...

Cornel West, in this debate or another, referenced a quote he particularly liked : ***No absolute condemnation of anyone.***

The History and Sociology of Computer Science and Technology II (end)

Camille Akmut

January 28, 2022

PRIMARY SOURCES : COURSE MATERIALS

— Abelson, Harold and Sussman, Gerald. SICP video series.

An emancipatory class based on the now classic textbook :

Characteristic of exchanges found in this class, Sussman answers a student's question (presumably about such or such, possibly missing functionality) so :

"My feeling about that, is that, I would like to teach you how do it so you don't depend on some language designer (...) You make it yourself. You roll your own."

(For further context, the programming language used in this course - some Lisp or Scheme - is especially well suited for re-implementations of language features, and accessible to beginners.)

Iconoclast, it also features philosophical thoughts about the discipline as whole (by Abelson, in this case) :

"Computer, so-called science, has actually a lot to do with magic."

At one point Sussman puts on a red hat, and it would break the frame of this work to detail all of their (hacker tradition) shenanigans...

FICTION

— Odd Taxi (2021)

Regularly, the issue of which film or series was able to capture social media the best is debated, and various answers are given (The Social Network, Mr. Robot, etc.) but the unlikely best candidate may actually be this stand-out anime (exceptional writing and editing, in particular). In one episode [7 or 8?], the location of a lottery winner is determined based on Twitter posts, photos and videos. Also includes various realistic portrayals of other aspects of our technologically advanced societies, such as addictive "gachapon" mechanisms in -mobile phone- video games.

— Fassbinder, RW. 1973. *World on a Wire*

- " - What's the difference between a (regular) computer and the simulation?
- It's an entirely new generation of computers.
- And, who profits?
- As far as I'm concerned, everyone! "

— Gremm Wolff. 1982. *Kamikaze 1989*.

The other science-fiction film associated with Fassbinder, in a role as a futuristic detective with a preference for leopard prints. (Electronic music by Tangerine Dream.)

— *Cyberpunk 2077* (2020, official). CD Projekt.

"cyberpunk" labor practices, suing investors, gamers who couldn't game on Christmas, devastating early critique ('Dad rock'), etc. etc.. A meta, meta product.

Outside of the wider California area, few other places are as evocative of new, computer technologies as the geographical zone defined by Hong Kong and neighbor Shenzhen. Serving as background for key events as varied as the iconic *Ghost in the Shell* visuals, meeting location of important journalists and whistle blowers, highly concentrated gathering place of Asia's billionaires, testing grounds for the most extreme of capitalist experiments, "[city] of neon lights" and home of the world's greatest electronics bazaar. A function previously played by Japan-Tokyo (at least in the imaginary of some science fiction writers).

DOCUMENTARIES

— Wired. 2016. *Shenzhen: The Silicon Valley of Hardware*.

circa 1h10m. Features well-known hackers / domain experts (bunnie above).

— Poitras, Laura. 2014. *Citizenfour*.

The filmmaker, and reporters meet an unknown IT worker at a hotel (Snowden).

— Friedman, Milton. 1980. *Free to Choose*.

Referring to Hong Kong : "*If you really want to see how the free market works, this is the place to be.*" Companion to the eponymous, apologetic book.

MONOGRAPHS, ESSAYS, REPORTS...

— Fraser Institute. 2020. "Economic Freedom of the World". In part. pp. 9, 88...

Paying even little attention to their ranking make-up, one finds that indicators such as "property rights" in combination with "police reliability" (the classic combination of Bourgeois law and Baton), as well as "Hiring and firing regulations", "collective bargaining", and "hours regulations", are used to establish a country's supposed freedom...

The Fraser Institute is also the publisher of unforgettable blog hits such as 'Let's not double-down on the nanny state' (in defense of Thatcher), and parrots of Hayek phrases like the scary 'road to serfdom' (i.e. anything that isn't resembling capitalism).

— *City of Protest*, Penguin, in part. ch. 1.

If there is one billionaire most synonymous with Hong Kong then Li Ka-shing (Hong Kong's wealthiest man); presented by the Harvard Business school as a "*lesson in integrity*". Not quite :

"In April [1967], the Hong Kong Artificial Flower Company, owned by Mr Li Ka-shing (... chairman of the Cheung Kong and Hutchison groups), announced onerous new conditions for workers, which would reduce wages and job security. When workers protested, seeking to negotiate with management, the company responded by dismissing over 600 employees, prompting strikes and protests outside the factory gates. With support from the FTU, the dispute escalated into violent confrontations, which spread to nearby Kowloon neighbourhoods. Police and protesters clashed, and tear gas was used to disperse the crowds."

(FTU : "pro-communist trade unions, in particular the Hong Kong Federation of Trade Unions", This chapter has other examples of organizing by Hong Kong's people.)

— Gibson, W.. 1993. "Disneyland with the Death Penalty". *Wired*, 04.

Classic essay (about Singapore, where high-tech meets strict laws/morals).

NEWSPAPER ARTICLES

— Lam, Benny. 2017. "Boxed in: life inside the 'coffin cubicles' of Hong Kong - in pictures". *The Guardian*, 07/06.

This journal later published an article on the same topic ("My week in Lucky House") containing the following statistics, based on data reported by the government:

"200,000 people living in some form of subdivided apartment" with the number "likely higher, as many illegal apartments were left uncounted".

— Dec. 2021. “Foxconn India factory workers hospitalised...”
and “Women force change at Indian iPhone plant...”. *Reuters* Var.
reportings between the 18th and 30th.

In the shadows of Christian-infused pagan customs and capitalist extravaganza,

*”crowded dorms without flush toilets and food sometimes crawling with
worms”*

were the circumstances in which the first world’s gifts were produced.

These events follow the Foxconn suicides in China (where conditions were so bad
people started throwing themselves out of windows). Luckily, in Taiwan democracy exists
and Terry Gou is a distinguished, contributing member of society there and elsewhere.
In India, near Chennai (a major Southern city), far from anarcho-governmental digital
horizontalness, his company continues to sow tragedy and death alike with only minor
disturbances [the factory re-opened?].

Historically, poor women have been employed in the textile industry among others:
see the social historians’ descriptions of similar 19th century catastrophes, e.g. at the
Pemberton Mill.

— Jan. 2022. “Apple spotlights Black voices during Black His-
tory Month” Apple.com, 26/01.

*“... Fitness+ will also release a new episode of Time to Walk, an inspiring
audio experience on Apple Watch, featuring activist Ayo Tometi, one of
the founders of the Black Lives Matter movement.”*

[https://www.apple.com/newsroom/2022/01/apple-spotlights-black-voices-during-black-
history-month/](https://www.apple.com/newsroom/2022/01/apple-spotlights-black-voices-during-black-history-month/)

Two figures of the historian of computer science.

Camille Akmut

November 16, 2019

Abstract

The computer scientist-turned historian, and the journalist-turned the same. A meta-analysis, or sociological historiography...

Introduction

In the vacuum left by historians – these gentlemen and gentlewomen were too preoccupied with the Habsburgs, and continue to be – a history of computer science nonetheless emerged.

Its actors, we have argued in the past already, having also gone through their works, fit into two categories : the computer scientist- and the journalist-turned historians.

This was not by accident as much as by default.

(As to why this is so, we must assume the combination of mutually exclusive cultures.)

We give a brief overview of trends here.

1. Journalists-turned historians

Journalists-turned historians : authors of some the best and worst works encountered.

The best is found in books such as Black's *IBM and the Holocaust* or Levy's *Hackers*.

The former is a real grand book that is unlikely to be surpassed soon. It does not stop to reflect on us and our times : when reading descriptions of Thomas Watson, the paternalist head of IBM, in the Berlin of the 1930's, we think of course of today and various executives from Microsoft (parent company of Github) to Gitlab; after Watson, they are set on convincing us that "serving everyone" is a public interest virtue...

This is history with a real potential (for the present).

The other has reestablished in all of its richness the original hacker : an academic or extra-academic modifier of systems...

(Less good is found in Hafner and Lyon's history of the Internet : the reader left to put together the pieces of their source material puzzles.)

2. Computer scientists-turned historians

These historians are most polite – this we must leave to them; Their books are like their algorithms.

Reading only them one could not be faulted for thinking that this is what history is, and all that history is capable of.

In their heads, Mommsen has just published vol. 1 of the *History of Rome* — historical science circa 1850. (They too have their heroes...)

Their most important value they do not make explicit so we will do it for them : neutrality.

Neutrality in all matters. And, lots and lots of dates — down to the last hour, of the last day, of the last month.

If the history of computer science – this most important and critical history – was left to them, it would take us another century just to reach Duby.

Let us be clear : what they have done is – for the most part – a history of digits and numbers equivalent to the old history of kings and queens.

(The expression “lackeys of numbers” might have not been from Marx...)

To put it less mildly : the scientific equivalent of centrist politics.

The best that has come out of this are the contributions by Donald Knuth for instance : the historical references found in *The Art of Programming* that help us put back in their historical context the variety of algorithms evoked there, his many articles (e.g. on early computer languages), and more biographical and auto-biographical writings (e.g. on computer science at Stanford, including bias).

Another example of this is the sum produced by Goldstine, computer science from Descartes to today...

The existence of such historians is in no way specific to computer science, but is common to most other disciplines (astronomers-turned historians, mathematicians the same, etc.).

Historians did not write their history, so they wrote it themselves :

This was the law of the history of science as it had been for a long time (thought not it only).

3. The so-called “*historians*” of science

This category is little more than an extension of the previous; but whereas computer scientists do not seem very insistent on historian titles (presumably holding their own discipline in higher regard), they are.

Historians of science are perhaps one of the most eclectic groups amongst historians, but among them one demographic has always struck us as peculiar : physicists-turned historians, found in such great numbers here... Because we have met so many of them now, we cannot ignore any longer, and should try to make sense of them :

Having received no education or training in history, these improvised historians summon theories drawn randomly from places as diverse (and incompatible) as 18th c.-style history and the latest intellectual fashions from Goldsmiths; resulting in a true hodgepodge science that could only pass as history, and science, amongst themselves, and in their institutions.

At one of the Max Planck institutes, we heard for instance a young and hungry future administrator boast :

“Everyone in my research group has at least a Master’s [degree] in physics”!

My, my, but we must remind : a mere sense of chronology does not make one a historian. No more than boundless emotions qualify one as an ethnographer or anthropologist.

As to this last group, encountered again recently :

Their teenage diaries lead them straight to ethnography;

a strange one where the studied subject all too often, all soon disappears – usually about one third into their books – such as to make room for what had been their center of interest all along, chiefly themselves;

their own feelings, and anxieties, and head-splitting confessions... The “*exhalation of subjectivity*” evoked in distaste by Georges Canguilhem in the context of Sartre : their philosophical predecessor, we could say the same of them today.

This was, briefly, the context in which we developed our work.
(The most critical parts of the history of computer science came from feminist perspectives, as found in Abbate for example; but this alone, though important, is not enough. Reevaluations of Turing's legacy also seemed promising, if only at first.)

“*What is computer science?*” The original
debates surrounding the birth of computer
science and the myths born out of them
(1960-1975) : a selected bibliography.

Camille Akmut

Abstract

This publication concludes our series “What is computer science? On two crises.” Having covered, perhaps contributed to its current crisis, we turn at last to the original : the birth of computer science as a constituted discipline amidst questioned and defended scientificity in the 1960s and 1970s. We give a summary of our previous findings as introduction, and a bibliography with helpers.

Introduction : a changing culture

What is computer science?

This question, which surrounded the birth to computer science as a constituted discipline, continues to accompany its young, but large existence.

No other science matters more than it now : it has penetrated all others. It is likely to be defining for our civilization in decades, and centuries to come. Perhaps, it will also be its end.

—
Many continue to focus on bankers and economists : these important economists cannot be blamed, they are of their times, and cannot escape them – as we are of ours.

One of them proposes universal basic income, the other progressive taxation.

But, they mistake “old new cowboys” for “new cowboys”, and thus miss the new ones – we have argued.

—
Fein, Gorn, Forsythe, Conte, Atchinson... : the pioneers of computer science as a ‘constituted’ discipline. Programs, departments, curricula, etc.

In the beginning, computer science and computer scientists had no names and no fixed identities : spaces of uncertain boundaries, filled with various scientists brought together by common preoccupations around what some of them would soon call “the phenomena surrounding computers”.

Our new computer scientists have forgotten, and in fact do not know the history of their own discipline : for, among “phenomena”, they were first.

—
“What is computer science?” : a title characteristic of papers from this period, which is to say the 1960s and 1970s.

Those who answered tackled this problem in various ways, each giving the question a new inflection in the process : some answered head on, and thought well to establish the scientificity of their budding discipline by comparison to other, more established ones¹.

Others focused on issues of curriculum².

Notably, others yet, among ACM members and their various committees, had recognized the importance of societal issues early on (Jean Sammet, if we are correct, played a role here.)

But, soon enough – for they were alone in being able to undertake this – computer scientists began to answer by looking back at their ancestors, going as far back as they could – even the Summerians, and establishing their heroes. Among them, Donald Knuth occupies a special place.

He was part of the model of the “computer-scientist-turned-historian”, as we have put³. Next to them stood the soon to be “journalists-turned-historian”, by default too.

¹So, did the trio of Turing Award laureates.

²Atchison, Conte et al.

³As Goldstine had been.

Their accounts mixed tribalism, and allegiance to their own institutions, and people, and ignorance of the historical discipline and its own methods.

So, for instance, when Forsythe, and Knuth following, insisted on tales of Stanford as ‘the first’ computer science department.

The current state of our understanding is Purdue, with Wisconsin playing a notable role too for having awarded some of the first advanced degrees, including to minority groups.

Gorn played at least as important a role as Forsythe, if not greater⁴.

Long gone are the days of the first crisis of computer science : in the 1960s and 1970s, computer scientists were busy defending their discipline and creating a prize for it : they thought establishing parallels with mathematics and the Nobel would help⁵.

But, *long, long* gone are those days. As early as the 1980s, it was mathematicians, and phycists, like Feynman⁶, who began to reflect on this oh so important science of an immense future. They did so, because not only did it provide them with tools they did not come up with, but inevitably put – now their – existence into question.

A mirror to a mirror.

With this, we conclude this series :

The current crisis of computer science : the identity and responsibility of computer scientists.

We gave our answer, which one day may be theirs : computer science is a social science.

The very earliest such publication came in the form of a... utopia!⁷

“One indicator of a changing culture is the set of new names and words for new ideas, things, modes of behavior, activities, vocations, avocations, intellectual disciplines”

⁴Forsythe cites him multiple times in his earliest writings (e.g. Forsythe 1965 and 1966).

⁵Dijkstra and Knuth had concentrated on establishing links with the “queen” discipline of mathematics. See Dijkstra 1974 and Knuth 1974.

⁶*Lectures on Computation*.

⁷Fein 1961.

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