Always move to seek perfection: The New Equilibrium Index Calculation for the science of Physics and Astronomy

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Abstract

This notebook proposes a new method of calculating the equilibrium index for the physics and astronomy using the formula I created in April 2016, which originally named ad "the Haryadi Index", and then I changed the name to "the Harmony in Gradation". This idea may be useful for physicists and astronomers to examine the "future" of the pair of objects that must move in order to achieve a state of equilibrium. I submit to the physicists and astronomers of the world to further examine the usefulness of the method, and write it in the journal, and in order to do a preliminary study, experts may try to deepen the soul of this method by simulating some calculations using the internet calculator I created on my blog, i.e. at the internet address <http://sigitharyadi.net/multidicipline/equilibrium-index-calculation/>

Preface

The mountains in front of us seem to remain in place and spaced equally all the time, but millions of years later they turn out to be the distances that show that they are always moving. And, we stand on the layers of the earth's crust that we are unaware of the movement, but since we experience an earthquake, then we realize that there has been a collision between two different layers of the earth's crust, which awaken us that they are constantly on the move. And, every day we observe the moon and sun, then we know that the position and the distance of the moon and the sun has dynamically changed, where we have been taught by physicists and astronomers about the movement of the earth, the moon, the sun and all the celestial bodies in the universe.

I have made a formula that will be useful for the physicists and astronomers to examine the "future" of the pair of objects that must move in order to achieve a new equilibrium state, not only between the pairs of objects but also with all objects others around it. In detail, the equilibrium between a pair of objects is dynamic, where, if taking into account only one pair of things, the equilibrium condition is always imperfect, there will be a percentage of the imbalance, where this imbalance will be offset by an imbalance condition with other objects around the object pair which has the opposite direction vector. It is this situation that causes each object or pair of objects to move in a new equilibrium point, so we need the formula to calculate the equilibrium index, which must simultaneously have two opposing elements, namely the element of equilibrium and the element of imbalance.

The Method

The need to accurately calculate the future of pair of objects will be answered with the "Haryadi Index" or "Harmony in Gradation", where the formula is to have two opposing elements, the "Harmony" element representing the equilibrium and the "Gradation" element that represents an imbalance.

Here is a formula from "Haryadi Index" or "Harmony in Gradation":

$$HiG = \frac{1}{[N \cdot \{(\sum_{i=1}^N S_i^2) + (\sum_{i=1; i > j}^N \sum_{j=1}^N (S_i - S_j)^2)\}]}$$

The Harmony

The Gradation

Where

$$\text{Element Strength} = S_i = \frac{x_i}{(\sum_{i=1}^N x_i)}$$

Example Calculation:

Given: When $T = t_1$, the pair of objects A and B, have the resultant tensile force and centrifugal force on themselves respectively and also from / to other objects about 10 N and 10.5 N

Calculate the equilibrium index that occurs between the pairs of objects at the time $T = t_1$.

Answer:

Element strength: $S_1 = 10/(10+10.5) = 10/20.5$ and $S_2 = 10.5/20.5$.

The Equilibrium Index = $1/(2*((10/20.5)^2 + (10.5/20.5)^2) + ((10/20.5) - (10.5/20.5))^2) = 99.82\%$.

Note: Note: The equilibrium index at $T = t_1$, which is not exactly the same as 100%, which occurs because the pull force A is smaller than B, will cause A to try to move away from B in order not to hit B, and this goal can only be achieved when there are other objects, e.g. C which at the same time is also not in equilibrium with A, which will cause A to be attracted to C because the pull force C is stronger than A (when position C is outside the BA line), but when position C is in the BA line, then C must have a more repulsive force than A, to keep A away from C and B.

The Calculator

I submit to the physicists and astronomers of the world to further examine the usefulness of the method, and write it in the journal, and in order to do a preliminary study, experts may try to deepen the soul of this method by simulating some calculations using the internet calculator I created on my blog, i.e. at the internet address <http://sigitharyadi.net/multidicipline/equilibrium-index-calculation/>

Notes

In order to understand the concept of "Haryadi Index" or "Harmony in Gradation" that became the spirit of this calculator, please read my writings in the following bibliography.

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