

Incompleteness of Control theory in resolving, 'How Should Humanity Steer the Future?', while Universe itself is a Real-time Control system

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Abstract

While 'Steer' is the control in real-time, Control theory is considered as the tool to find solution for, 'How Should Humanity Steer the Future?', in that the Universe itself is a Real-time control system. Though Humanity is causal for the ecological imbalance in Biosphere, it is out of the Real-time control system of Universe and thus the remnants on error correction by the Sequential feedback control system of Universe effects Climate change that has an impact on Humanity. As the feedback loop of a control system is within a time domain, describing Universe with Sequential feedback control system needs an alternative cosmological paradigm that has different nature of time adaptable for this scenario and thus a paradigm, '[Eigen-rotational Clusters of String-matter Universe \(ECSU\)](#)' is been explored to solve this. In this paradigm, as matter is ascribed as eigen-rotational string-matter continuum; the dynamics of universe is described with discrete cyclic-time in holarchical reference time.

Being the universe as an infinite sequence of feedback loops in holarchical reference-time, defining an external control system in Real-time is not plausible. Thus a finite state sequential feedback control strategy is proposed for Humanity to adapt on this object and it is not a Real-time control system. This indicates that the Control theory is incomplete in providing Real-time solutions on this object, as the Universe itself is an Infinite sequential feedback control system. This incompleteness of Control theory on this object is due to the limitations in building Real-time reference data from Universe that is holarchical in dynamics. Thus in this strategy, a Virtual real-time data of Universe is proposed as the Reference data to delay the metamorphosis of earth, while the destruction of Humanity in the future is not preventable.

Key words: Eigen-rotational clusters of string-matter, Tetrahedral-brane (T-brane), Discrete cyclic-times, Holarchical reference time, Virtual real-time data.

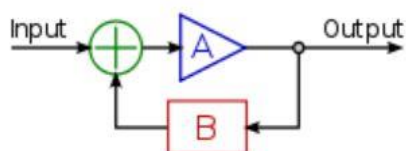
Introduction:

As 'Steer' is the control in real-time, 'Steer the Future' is the control of time that is empirically not plausible for absoluteness, while time is the core for any control system, in that the core itself is to be controlled for this objective. Alternatively, the nature of time is investigated and the Universe to be explored with Control theory for appealing mitigation and reschedule on anticipated destruction of Humanity in the future.

Existence of dark matter that is indirectly inferred by its gravitational effects on visible matter indicates the limitations in Observational science and the imperativeness to explore the nature of time and its emergence, as time is the core in Observational science.

Since human body is one among the classic examples of feedback control system, we consider the universe also as a control system that regulates itself in entirety and not in isolated localities. This contradicts the Big Bang cosmology.

Thus in this article we have discussed Control theory in reference with an alternative cosmological paradigm, the '[Eigen-rotational Clusters of String-matter Universe \(ECSU\)](#)', rather than the Corpuscularianism scenario in Standard cosmology to resolve the time paradox that is causal for the constrains in Observational science while the dynamics of universe is described with discrete cyclic times in holarchical reference time.

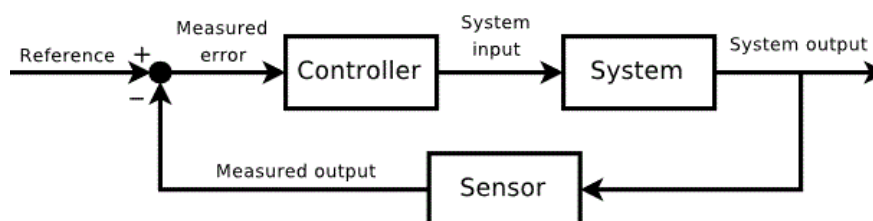


As the feedback control system operates within a time domain, the Control theory has limitations in controlling the input data on error measurement and correction; while the input data and output data are external to the time domain for the controller system in ECSU paradigm.

Thus we recommend adaptations in Control theory from its current form to have mathematical optimization while handling the data of Nature in near reality, though in reality 'Steer the Future' by Humanity have empirical limitations. This indicates the incompleteness of Control theory in manipulating the spontaneous control system of Universe, from externally by Humanity.

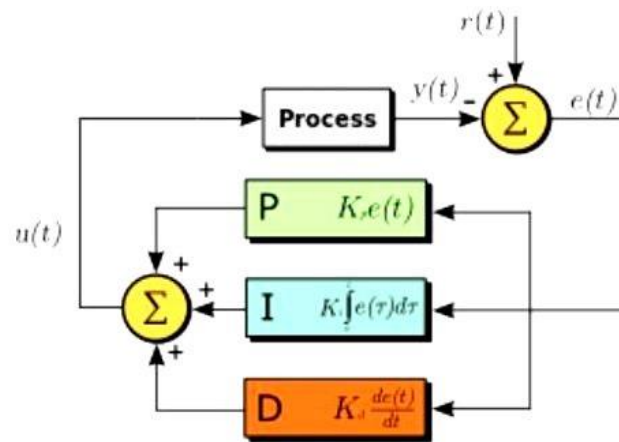
Synopsis of Control theory and Control system on this object:

As control theory provides solutions for the controller to decide corrective actions on the stability of the system, it is much adaptive to assign guidelines for Humanity to Steer the Future.



Though the Proportional-integral-derivative notation of a controller system seems to be much useful in calculating the 'error' value as the difference between a Measured Process

variable and a Desired Set-point that the controller system targets to reach, it is limited within a time domain^[1]; whereas the universe itself is a system of holarchical controller systems in discrete cyclic-times, in that Riccati equation is applicable for transformations^[2].

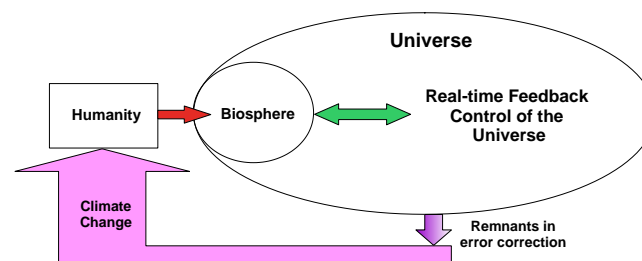


As the 'emergence of time' differs in string-matter continuum scenario on ECSU paradigm from the Corpuscularianism scenario in Standard cosmology, the Laplace transform that is assigned with probability theory to solve discrete-time control theory problems, does not describes the feedback control systems of the Universe. This indicates that the Control theory provides only guidelines to assign strategies for resolving, 'How Should Humanity Steer the Future?' and not provides absolute solution on this object in Real-time.

Impact on Biosphere by Humanity, while it is out of the Real-time feedback control of universe:

Darwinism and the principles on Evolutionary biology are suggestive of spontaneous increase in chemical potentials of earth in the past, as the growth of biosphere. The self-regulating nature of ecosystem in the biosphere is indicative of the Real-time sequential feedback control of the Universe, in that the biosphere is a part of it, whereas the Humanity is out it.

Taxonomy on biomes, their chemical potentials and their anisotropic radiation with the universe, is indicative of the cosmic connectivity of Biosphere in the Holarchical universe^[3].

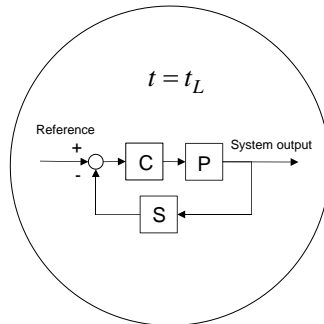


While Humanity is causal for the ecological imbalance in the biosphere, the Universe as a Real-time Sequential feedback loop control system effects Climate change that has an impact on Humanity.

This implies that the causality of Climate change is the effect of remnants in error correction by the Infinite sequential feedback control system of the universe in Holarchy and thus finding solutions on 'How Should Humanity Steer the Future?' is much imperative.

Nature of time in ECSU paradigm on exploring the control system of Universe:

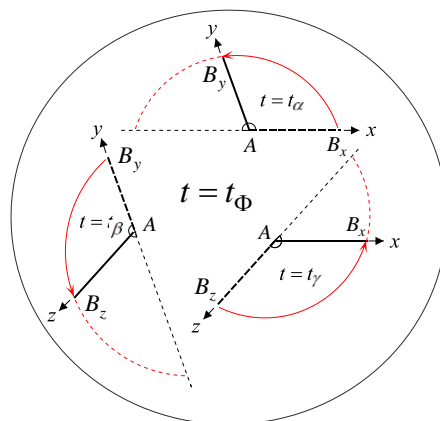
In an isolated control system with a feedback loop described in Standard cosmology by Corpuscularianism, the reference data and the system output data of a controller system are in the same time domain.



C: Controller, P: Processor, S: Sensor

Whereas in Sequential feedback control system a discrete time in sequence is imperative as the time domain of each feedback loop differs. This indicates the limitations of Control theory in Corpuscularianism to ascribe Spontaneous feedback control of Universe in Standard cosmology, as the nature of time on this differs from that of the eigen-rotational string-matter continuum scenario of Universe^[4].

Thereby the Singularity theory on Big bang and Big Crunch does not support Spontaneous feedback control of Universe and this indicates that the dynamics of universe is in Holarchical cyclic-time, while the matters of universe are in segments of eigen-rotational string-matter continuum.

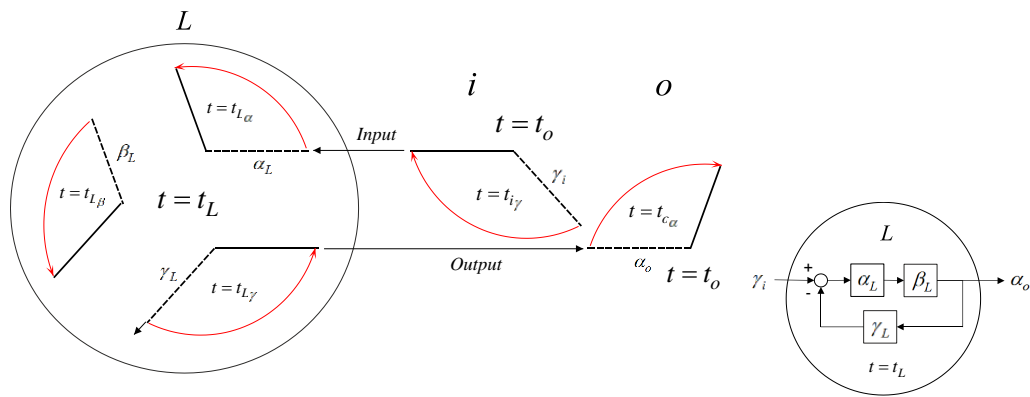


$$\left[\langle t_\Phi \rangle \rightarrow \langle t_\alpha, t_\beta, t_\gamma \rangle \rightarrow \left\langle \frac{t_\Phi}{3} \right\rangle \right]: \text{quantization of cyclic time}$$

where, $t_\alpha + t_\beta + t_\gamma = t_\Phi$: period of an eigen-rotational cycle

$$\Rightarrow \left[\frac{t_\alpha}{t_p} = t_{\alpha p}, \quad \frac{t_\beta}{t_p} = t_{\beta p}, \quad \frac{t_\gamma}{t_p} = t_{\gamma p}, \quad \frac{t_\Phi}{t_p} = t_{\Phi p} \right]: \text{in Planck time unit, } t_p : \text{Planck time}$$

In ECSU paradigm; the Controller, Processor and the Sensor functions of a feedback control loop are notational as the functions of three eigen-rotational phases of a string-matter segment that evolves a three-dimensional Tetrahedral-brane (T-brane), in that two adjacent phases of an eigen-rotational cycle of that string-segment exhibits input and output actions with the desired eigen-rotational string-segments of T-branes at corresponding phases, in continuum.



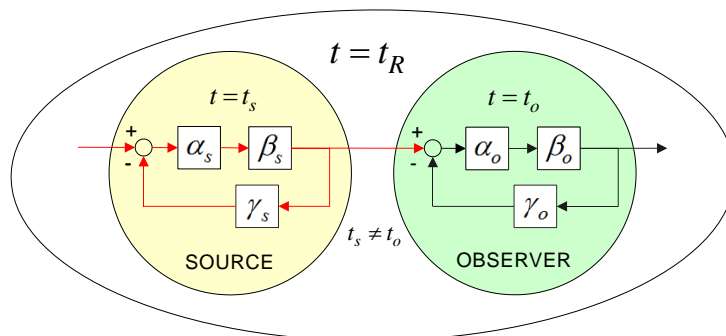
$$\gamma_i \rightarrow |\alpha_L \rightarrow \beta_L \rightarrow \gamma_L| \rightarrow \alpha_o, \text{ where, } \gamma_i \rightarrow \|\alpha_L\|, \|\gamma_L\| \rightarrow \alpha_o,$$

$$\Rightarrow [t_{i\gamma} \neq t_{L\alpha}], [t_{L\gamma} \neq t_{o\alpha}], \text{ where, } [t_i \neq t_L \neq t_o]: \text{reference times}$$

Thus in ECSU paradigm the input data, the feedback loop and the output data are in discrete time domains, in sequence.

Source and Observer feedback loops in discrete cyclic time:

While considering the source and the observer as two discrete eigen-rotational string-segments, the action of source string-matter segment with the observer string-segment effects transfer of eigen-rotational energy from the source to the observer.



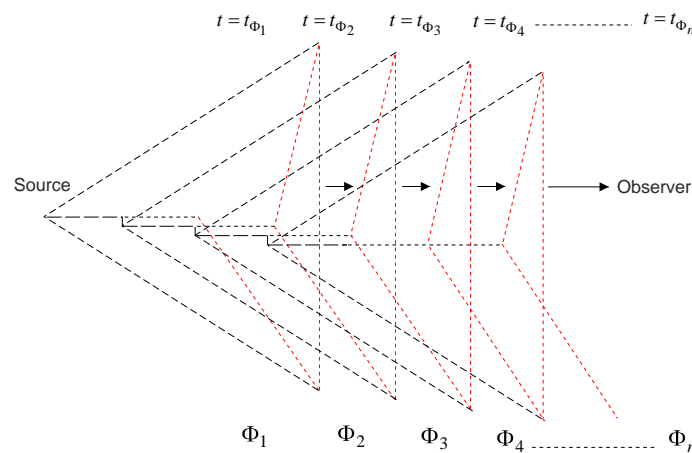
$t_s = \text{time domain of Source feedback}$, $t_o = \text{time domain of Observer feedback}$,
 $t_R = \text{reference time domain}$

$$\left[[t = t_s] \rightarrow \left[\frac{t_s}{t_p} = t_{sp} \right], [t = t_o] \rightarrow \left[\frac{t_o}{t_p} = t_{op} \right], \text{ where, } \frac{t_{sp} + t_{op}}{2} = t_R \right] : \text{in Planck time unit}$$

Thus, discrete time domains is notational for the source and observer feedback loops, in that the mean of both time-domains is the reference time-domain for both, in Planck time. This implies that the instant of action is within the observer time domain in a reference time domain and thereby a holarchical reference time^[5] is expressional for all actions of the universe, while in dynamics.

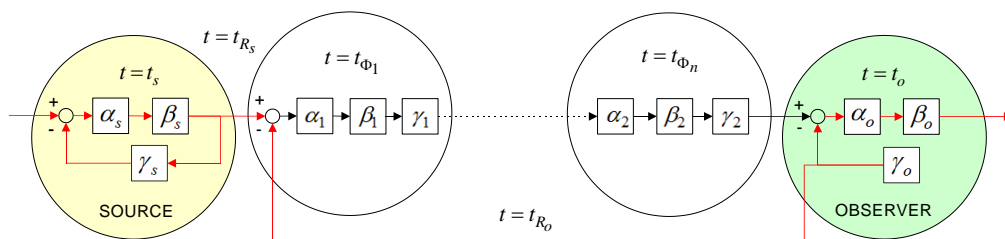
Feedback loops of propagating T-brane between the source and observer:

In ECSU paradigm, the wave mechanics is described as progressive eigen-rotation of string-matter segments that is ascribed as propagating T-branes. This implies that the T-brane propagates in sequential periods of time, while there is spiralling of an eigen-rotational string-segment in open cycles, with three phases in each.



$$\left[t = t_{\Phi_1}, t = t_{\Phi_2}, \dots, t = t_{\Phi_n} \right] \rightarrow \left[\Phi_1, \Phi_2, \dots, \Phi_n \right] : \text{progressive sequential T-branes}$$

In this scenario, actions exhibited at the beginning and end of the propagating T-brane and thus a feedback loop between the observer and the beginning point of a propagating T-brane, is expressional.



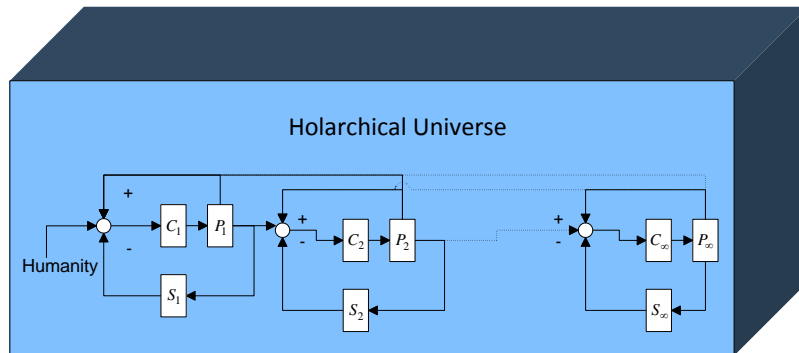
$$\frac{t_s + t_{\Phi_1}}{2} = t_{R_s} : \text{reference time of the source,} \quad \frac{\sum_{\Phi=1}^n t_{\Phi} + t_o}{2} = t_{R_o} : \text{reference time of the observer}$$

This implies that the source reference time and the observer reference time differs when there is propagating T-brane between them.

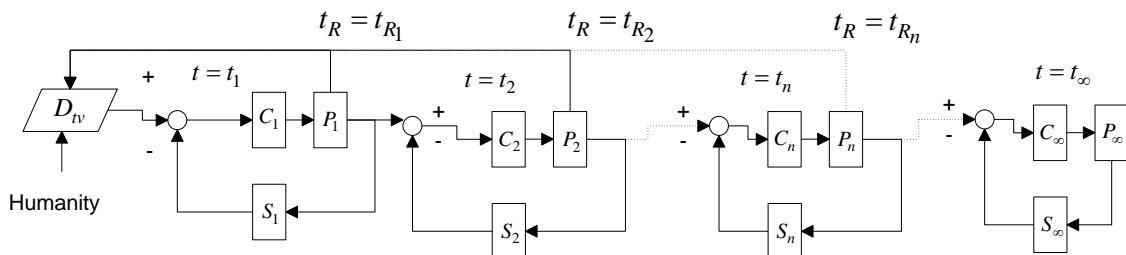
Incompleteness of the Finite state sequential feedback control system, for manipulating the dynamics of Universe:

While the flow of time is nondeterministic to describe the discrete events of Universe without holarchical dynamics, the Finite state sequential feedback control system is not applicable for the manipulations on the Universe. Thus the universe itself is described as an eigen-rotational string-matter continuum of clusters as T-brane, in that a holarchical cyclic reference time emerges with the dynamics of the holarchical clusters of Universe.

Thus the Universe is a control system of infinite feedback loops and the impact of Humanity on universe disseminates through its infinite sequential feedback control loops while the remnants on error correction by the feedback control effects as Climate change. This indicates that the Finite state sequential feedback control by the Humanity to ‘Steer the Future’ is incomplete as Humanity is out of the infinite control system of Universe.



$[\{C_1, P_1, S_1\}, \{C_2, P_2, S_2\}, \dots, \{C_n, P_n, S_n\}] \rightarrow [Infinite \ sequential \ feedback \ control \ system \ of \ Universe]$
 That is, by applying sequential logic, empirically it is only plausible to ascribe a Finite state sequential feedback loop control system to ‘Steer the Future’; that has limitations as the universe is infinite, indicating that the control theory is incomplete for an infinite universe^[6].



$$[t = t_1] \rightarrow \{C_1, P_1, S_1\}, [t = t_2] \rightarrow \{C_2, P_2, S_2\}, \dots, [t = t_n] \rightarrow \{C_n, P_n, S_n\}, \dots, [t = t_\infty] \rightarrow \{C_\infty, P_\infty, S_\infty\}$$

where, $D_{tv} \equiv (D_1 * t_1) + (D_2 * t_2) + \dots + (D_n * t_n)$, $[D_{tv} : \text{time variable reference data}]$

$$\Rightarrow [(D_{n+1} * t_{n+1}) + (D_{n+2} * t_{n+2}) + \dots + (D_\infty * t_\infty)]: \text{data of unobservable universe}$$

Altogether by exploring Environmental physics^[7] in a thermodynamic approach, inclusion of a Time variable Reference data in a Finite state sequential feedback loop control system, seems to have efficacy in ‘Steer the Future’ with limitations.

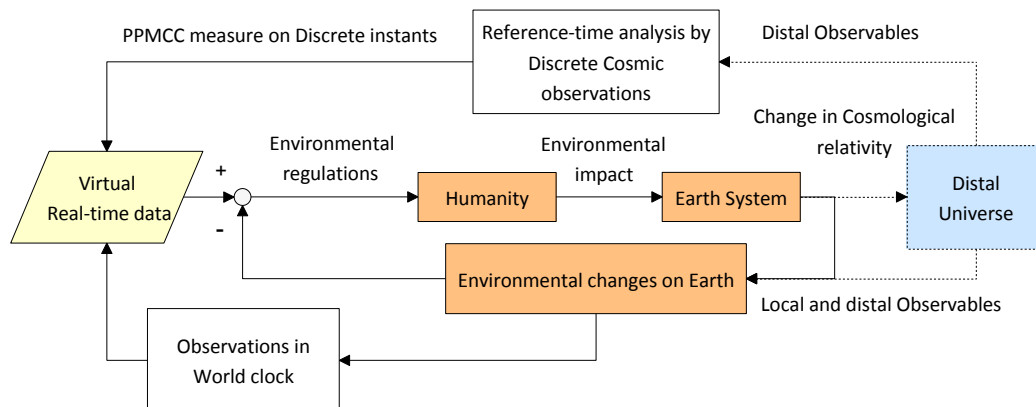
In this manifesto, as the observables for Humanity is limited with the extent of Observable universe^[8], the reference data for a Finite sequential feedback control system is finite and this indicates the incompleteness of control theory to ‘Steer the Future’, while the universe is infinite in holarchy.

Moreover even the most efficient Finite state sequential feedback loop control system provides reasoning only in Fuzzy logic that is not deterministic to manipulate the infinite control system of Universe and provides only near-reality control for isolated applications like, environmentally manipulating systems on bio-molecular therapeutic applications, while the anisotropic radiations in bio-systems is causal for the localized molecular modifications that effects with the emergence of anomalies.

Thus the control theory is applicable only to assign guidelines for Humanity to ‘Steer the Future’ and not provides absolute solutions.

An alternative strategy on Sequential feedback loop control system with Virtual real-time data to ‘Steer the Future’:

As the finite state sequential feedback loop control system is incomplete in real-time, modifications with sequential logic to assign a strategy that is applicable for policy adaptations on environmental regulations to ‘Steer the Future’ by Humanity, is proposed in that Virtual real-time data from observations is to be organised as the Reference data for the controller system.



In this strategy Humanity is assigned as the Controller, Earth system as the Processer and Environmental change on Earth as the Sensor in a Feedback loop, while the succeeding sequential feedback loops are the thermodynamic units of Holarchical Universe.

Qualitative and quantitative aspect of the Virtual real-time data determines the efficacy of this control strategy, in that two groups of observations are imperative. This includes the observations of environmental changes on earth in reference to world clock and discrete cosmic observations in Holarchical reference times in that Pearson product-moment correlation coefficient is a good measure to extract Virtual real-time data from both observations.

Conclusions:

Though the Holarchical universe is a self-regulating Sequential feedback control loops of system, 'Steer' in real-time by Humanity is not plausible as Humanity is out of the Infinite sequential feedback loop control system of Universe.

Thus this strategy on Finite state sequential feedback control model to 'Steer the Future' by Humanity is not a real-time system, but while assigned with Virtual real-time data as Reference data for a control strategy; it provides guidelines for the Humanity, on environmental regulations.

A combinatorial analysis is imperative in organising and updating the Virtual real-time data while extracting data from the observables on environmental changes of earth in world clock and the discrete cosmic observations in Holarchical reference time, that in turn requires cosmic reference time analysis.

Altogether, with this strategy the Humanity may delay the metamorphosis of earth and destruction of Humanity, though it cannot be prevented.

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