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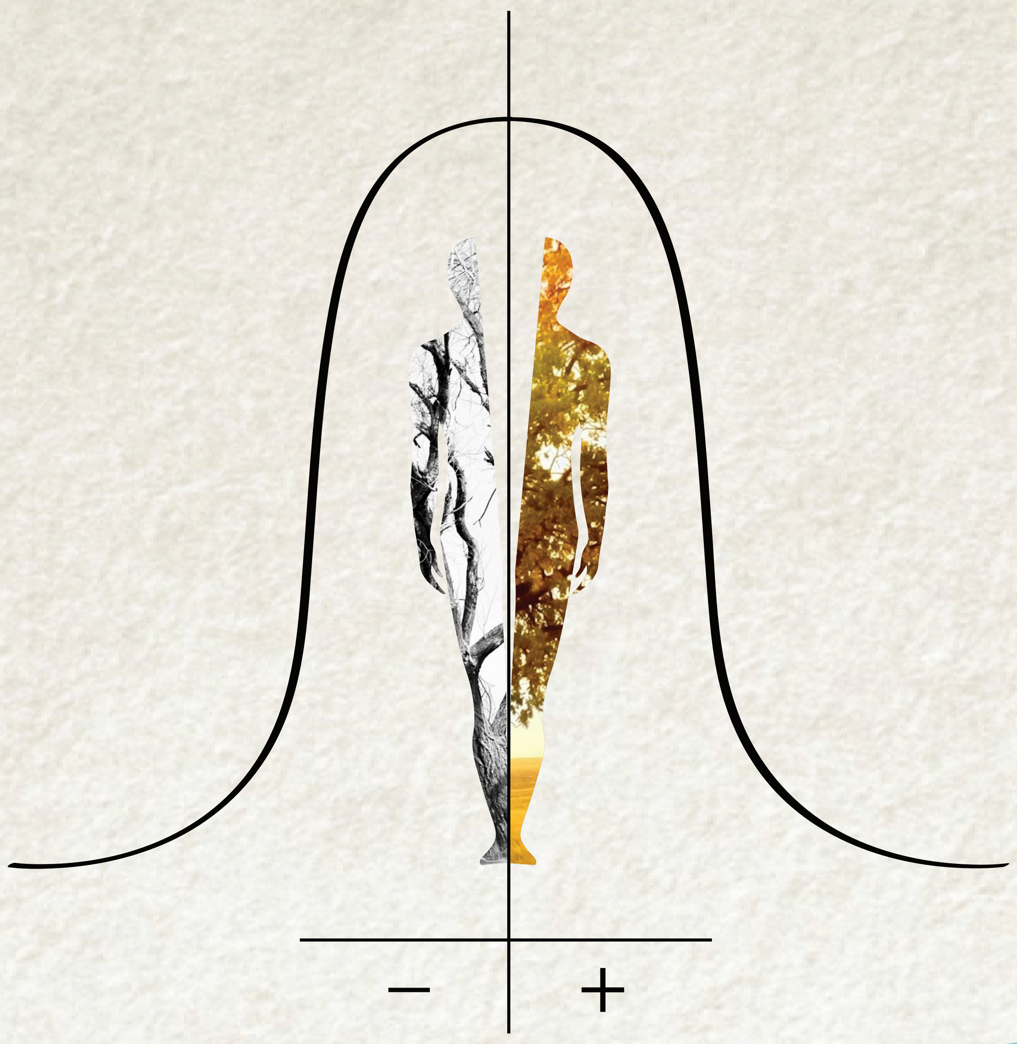

ABSTRACT : I start by defining 'Euceleration' as a measure of positivity of an evolutionary dynamic sequence.

RANDOM FOR A REASON : HOW STOCHASTICITY IS FITTER

$$\text{Euceleration}: EuC := \sum_{t,\alpha} w_{t,\alpha} \left(\frac{d^{\alpha} f}{dt^{\alpha}}\right)_t$$

Where f is the 'net fitness' of the system at time t, which could be defined as cumulative fitness of the population evolving and $w_{t,\alpha}$ is it's corresponding weight increasing with α. The possible evolving systems could be classified based on the mean fitness line of dynamics that could be called a 'soul line' into five classes labeled 'highest', 'higher', 'neutral', 'lower' and 'lowest'. For all of the classes except the highest, stochasticity has a qualitative advantage by means of 'rarity exploitation' : where the system exploits the rare fitter instances. The degree of advantage depends upon the skew of the stochasticity towards higher fitness. This seems to hint why stochastic dynamics might be fitter in natural systems.

Result 1

EuC of Pure Deterministic Dynamics < EuC of Regular Stochastic Counterparts < EuC of Irregular Stochastic Counterparts with identical soul-lines.
i.e. EuC increases with Stochasticity within a same soul-line group of dynamics by means of rarity exploitation, fitter class introduction with competitor exclusion and vivacity correction in mean EuC.

Result 2

Purely Deterministic systems are not mutable into stochastic systems, while regular and irregular stochastic systems are intermutable by means of duplication - mutation or transformation mutation and mutable into pseudo-pure deterministic systems due to stochasticity nullification. Thus, for a same soul-line group, there is always an irregular stochastic dynamical system connected to the regular stochastic systems.

Result 3

Input variables of a system yielding the EuC-carrying capacity are soul-line class limited and are finite ranged naturally. The complex biological systems are regular or irregular stochastic but not purely deterministic.

Result 4

Irregular stochastic systems correspond to the maxima of 'good' natural systems EuC-landscapes, with EuC increasing with Stochasticity.

$$Stochasticity \coloneqq \sum_{i,j} w_{i,j} (\,evenness\ of\ pdf\,)_{i,j}$$

$$= \sum_{i,j} w_{i,j} \left(\frac{1}{Convolution\ of\ pdf}\right)_{i,j}$$

$$= \sum_{i,j} w_{i,j} \left(\frac{1}{\sum_{x,\beta} w_{x,\beta} \left(\left|\frac{d^{\beta} pdf}{dx^{\beta}}\right|\right)_x}\right)_{i,j}$$

i is index of steps (sub-atoms) in generating the pdf of EuC, while j is that of a generative atom which is, for singular EuC, equal to unity. Evener the pdf's of parameters of the distributions at each sub-atom, evener that of the EuC, offering intensification of positive selection on EuC for teleologically biased evolutionary models with cohesion within fitter sub-class.

Conclusion

Complex natural evolving systems are locked into regular or irregular stochasticity as they have inevitable stochastic components. Within the stochastic outcomes, the EuC optima corresponds to higher stochasticity and thus might be indicating why such systems prevail commonly.

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References

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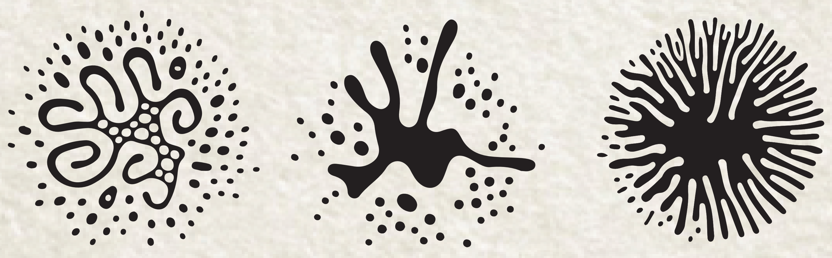

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