Qeios

Peer Review

Review of: "From Coherence to Control: A Non-Systematic Approach to Multi-Parametric Phenomena"

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I enjoyed reading this commentary piece written by Ion Sandu. Overall, I find the perspective informative and well suited for readers interested in complex systems, and in interdisciplinary domains dealing with nonlinear systems with many degrees of freedom, including psychology, economics, and the social sciences.

This manuscript offers a thoughtful and wide-ranging synthesis of the ideas and perspectives of many outstanding scientists from the seventeenth century onward, incorporating numerous major contributions of the twentieth century. This emphasis is particularly appropriate, as the twentieth century represents a period in which the bases of non-equilibrium mechanics and complexity science truly flourished.

Section 6, *"Epilogue — The Apprenticeship of Understanding — Science in the Age of Intelligent Companions,"* raises several stimulating and timely points. Its treatment of time, however, is particularly striking. Whereas the first five sections span centuries of scientific development in complex systems into the past, the sixth reads more as a snapshot of the present, with limited extrapolation into possible futures. Given the extraordinarily rapid evolution of artificial intelligence (a pace that contrasts almost ironically with the slower peer-review timeline in which this commentary was likely written, perhaps weeks or months prior), it seems plausible that machines may soon rival or surpass humans even in identifying meaningful structures, distinguishing them from mere patterns, and in making sense of complex phenomena. Although, in my opinion, the current discussion remains largely accurate, a more explicit engagement with such near-future scenarios could significantly strengthen this section,

especially given the possibility that its central "optimistic" claim may become outdated in the relatively near term.

"Multi-Parametric Phenomena" is a central term in the title and would benefit from a clearer and more explicit definition. It could also be useful to contrast this notion with the statistical concept of "nonparametric" methods, which are widely employed in complexity science and are often associated with counter-intuitive or emergent phenomena.

Finally, the sentence "Galileo's telescope and Bacon's method were tools for forcing nature to reveal its order" could be strengthened by briefly fleshing them out to clearly contextualize the role of the "new tools".

[Note: A minor typo was found in the text: "We found along the tim, three principles guide this practice:"]

Declarations