Review of: "Approach to Data Science with Multiscale Information Theory"

Tapas Tripura[1]

1 Indian Institute of Technology Delhi

Potential competing interests: No potential competing interests to declare.

In this paper, the authors use the Multiscale Entropic Dynamics (MED) to understand the dynamic and probabilistic nature of intricate quantum mechanical systems, which is claimed to be derived from the Boltzmann methods of Statistical Mechanics. It is further claimed that this approach can provide a deeper understanding of quantum mechanical systems and their behaviors within complex materials. The theoretical derivations are sufficiently brief and easy to follow.

However, I have few genuine objections. My comments are as follows:

1. The title “Approach to Data Science with Multiscale Information Theory” is misleading. There is no data science perspective in this article. It is a complete physics problem. Unless the data science word should be removed from the title, I do not recommend the article for publication.
2. The first paragraph of the abstract is completely vague. It does not provide any information on the contents of the article. The abstract should be precise and focus on the contents of the article.
3. The objectives and contributions of this work is missing in the introduction. A paragraph before organization briefly describing the objectives of this work should be provided.
4. The multiscale aspect should be highlighted and explained better. I found difficult to understand the multiscale aspect of the work, except from the equation (7).
5. The unnecessary statements regarding machine learning, artificial intelligence, and data science are present in conclusion too, which should be removed before publication.
6. Other minor comments are:

    1. There are punctuation mistakes throughout the draft.
    2. The Planck's constant denoted by the manuscule symbol is not defined in the introduction.
    3. QM should be defined before its use in the introduction.
    4. Author may consider providing more details on the derivations of equations (10) and (11).
    5. \sigma^2 is defined as Lagrange multiplier in equation (11) nut it is reserved for diffusion coefficient in equation (1).
    6. How the equation (18) is derived is not clear.