Qeios

Peer Review

Review of: "AI-Generated Hallmarks of Aging and Cancer: A Computational Approach Using Causal Emergence and Dependency Networks"

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AI-generated hallmarks of aging and cancer are very important in causal emergence analysis, as it is illustrated that hallmark-level features show stronger disease associations than individual genes.

The authors use machine learning tools to generate a quantitative form of hallmarks and use them to create a concise representation of multiple age-related diseases.

However, as a mathematician, I would like to know more about the computational framework, such as causal emergency analysis, parsimony predictive modeling, and dependency network analysis. In particular, I would need
- more information about regression, correlation, and two-way classification results, including odds ratios. P-values are demonstrated in the figures, but no conclusions about the significance of correlations are drawn;
- more statistically precise statements and a deeper description of the statistical methods could be used;
- more about the Pareto (power-law) distribution and its parameters is needed.

In sum, I miss some more description of the AI-related statistical methods. In particular, the PA index is the t-statistic for two independent samples with not equal variances: it should be emphasized and written that here we use the corrected sample variances. Also, the Dp index is the difference of the t statistics, but some statements are needed about its significance.

So I suggest publishing this paper with the above minor amendments.

Declarations

Potential competing interests: No potential competing interests to declare.