Performance of Jellyfish Optimiser on Projection Pursuit Problems

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Abstract

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Keywords: projection pursuit, optimization, jellyfish optimiser

Let's use British English ("American or British usage is accepted, but not a mixture of these")

1. Introduction [Nicolas and Jessica]

The rest of the paper is organised as follows: Section 2 introduces the projection pursuit method, including the indexes function and optimisation. Section 3 introduces the jellyfish optimiser and proposes mathematical expressions to measure the . Section 4 applies the jellyfish optimiser through different projection pursuit problems with varying dimensions and index functions. Section 5 concludes the paper.

2. Projection pursuit, index functions and optimisation [Di and Sherry]

3. The jellyfish optimiser and property for good optimisers [Nicolas and Jessica]

The jellyfish optimiser [1] …

Laa and Cook [2] has proposed five criteria for assessing projection pursuit indexes (smoothness, squintability, flexibility, rotation invariance, and speed). Since not all the properties affects the optimisation, here we define the three relevant properties (smoothness, squintability, and speed) mathematically and show that the jellyfish optimiser …

4. Application [Di and Sherry]

The jellyfish optimiser has been implemented in the tourr package [3] and we will use the diagnostic plots proposed in the ferrn package [4] to visualise the optimisation process.

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4.1. Going beyond 10D

The pipe-finding problem is initially used to investigate indexes and optimisers in Laa and Cook [2], and we extend it from a 6D problem to a 12D problem.

Jellyfish optimiser, as a multi-start algorithm, is efficient in [...] for high-dimensional problems

4.2. On skewness and kurtosis index

4.3. Another data example

5. Conclusion [Di and Sherry]

References

[1] J.-S. Chou, D.-N. Truong, A novel metaheuristic optimizer inspired by behavior of jellyfish in ocean, Applied Mathematics and Computation 389 (2021) 125535. doi:10.1016/j.amc.2020.125535.

[2] U. Laa, D. Cook, Using tours to visually investigate properties of new projection pursuit indexes with application to problems in physics, Computational Statistics 35 (2020) 1171–1205. doi:10.1007/s00180-020-00954-8.

[3] H. Wickham, D. Cook, H. Hofmann, A. Buja, tourr: An R Package for Exploring Multivariate Data with Projections, Journal of Statistical Software 40 (2011) 1–18. doi:10.18637/jss.v040.i02.

[4] H. S. Zhang, D. Cook, U. Laa, N. Langrené, P. Menéndez, Visual diagnostics for constrained optimisation with application to guided tours, The R Journal 13 (2021) 624–641. doi:10.32614/RJ-2021-105.