

A data assimilation library with Python for parallel computing

*中野 慎也¹、有吉 雄哉²、樋口 知之¹

*Shin ya Nakano¹, Yuya Ariyoshi², Tomoyuki Higuchi¹

1. 情報・システム研究機構 統計数理研究所、2. 日本文理大学工学部

1. The Institute of Statistical Mathematics, 2. Faculty of Engineering, Nippon Bunri University

Parallel computing is essential to reduce the computational time in the ensemble-based data assimilation. However, it requires skills in parallel programming. It is sometimes a hard task to attain high computational efficiency with ensemble-based data assimilation. In particular, the particle filter (PF) algorithm, which is applicable to nonlinear and/or non-Gaussian problems, contains a procedure difficult to parallelize.

It is thus challenging to achieve high computational efficiency with the PF even for experienced users.

We have developed a Python library named P-cubed (Python Parallelized Particle Filter Library), that enables us to use parallel-ready PF algorithms with high parallel efficiency. Now we are also planning to attach a module of other data assimilation algorithms such as the ensemble Kalman filter to this library. In this presentation, we introduce the parallelized PF algorithms which are already available in P-cubed and explain the design and characteristics of the library. Future prospects of this library will also be discussed.

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