# Article information:

A high-dimensional optimization method combining projection correlation-based Kriging and multimodal parallel computing | SpringerLink  
<https://link.springer.com/article/10.1007/s00158-022-03450-3>

# Article summary:

1. A novel Kriging metamodel is proposed to address the issues associated with high-dimensional surrogate models, such as prohibitive computational costs and low model accuracy.

2. The Kriging model based on projection correlation (KPC) introduces prior information into the Kriging modeling process, taking into account the nature of hyperparameters.

3. A parallel computing strategy combining expected improvement and minimizing prediction (MEI&MP) is proposed to further improve high-dimensional optimization efficiency and potential.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article provides a detailed overview of a novel Kriging metamodel that is designed to address the issues associated with high-dimensional surrogate models, such as prohibitive computational costs and low model accuracy. The authors provide evidence for their claims through numerical examples and structural optimization problems, which demonstrates the effectiveness and accuracy of their proposed method. Furthermore, they propose a parallel computing strategy combining expected improvement and minimizing prediction (MEI&MP) to further improve high-dimensional optimization efficiency and potential.

The article appears to be reliable in terms of its content, as it provides evidence for its claims through numerical examples and structural optimization problems. However, there are some potential biases that should be noted when considering this article's trustworthiness. For example, the authors do not explore any counterarguments or alternative solutions to their proposed method; instead they focus solely on promoting their own solution without considering other possible approaches or solutions that could be used in this context. Additionally, there is no discussion of any possible risks associated with using this method or any potential drawbacks that could arise from its implementation. Finally, while the authors provide evidence for their claims through numerical examples and structural optimization problems, it would have been beneficial if they had provided more detailed information about these tests in order to better assess the reliability of their results.

# Topics for further research:

* High-dimensional surrogate models
* Kriging metamodel
* Parallel computing strategies
* Expected improvement and minimizing prediction
* Structural optimization problems
* High-dimensional optimization efficiency

# Report location:

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