

Kitsune Optimiser Algorithm

Fergani Okba¹, Raihane Mechoug², Ahmed Bouzid Afulay³, * NaciraTkouti², and AIT ABBAS Hamou⁴

¹Universite Mohamed Khider de Biskra Departement de Genie Electrique

²Universite Mohamed Khider de Biskra Laboratoire de Genie Electrique Biskra

³Miskolci Egyetem Vezetestudományi Intezet

⁴Universite de Bouira

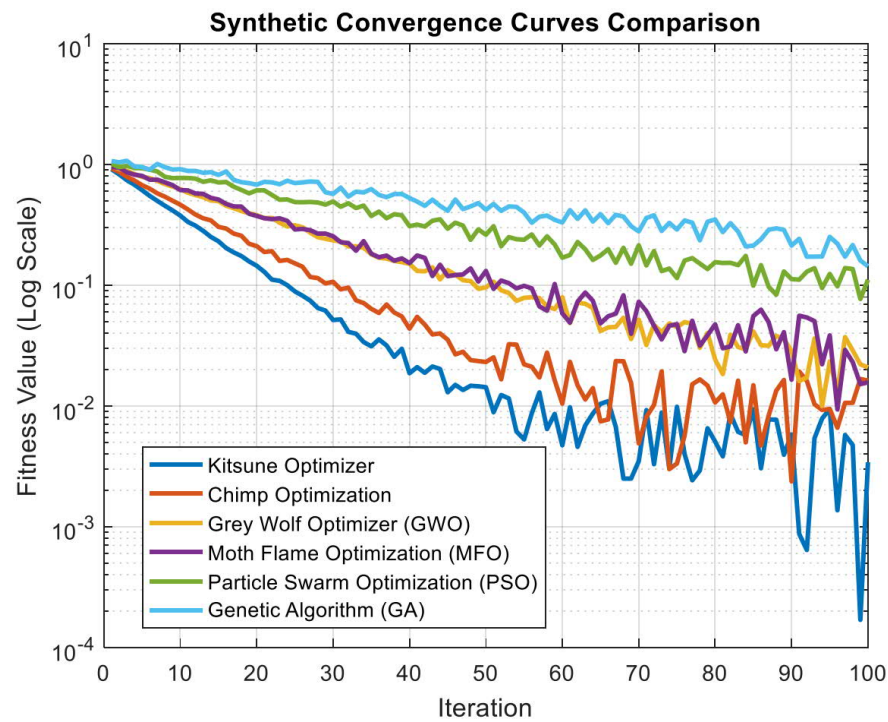
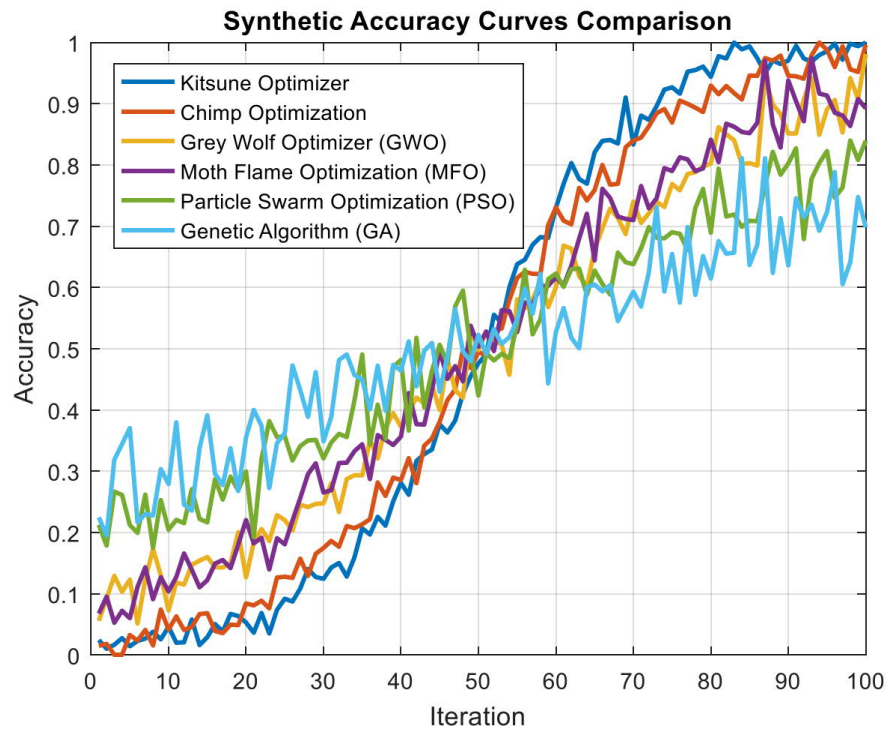
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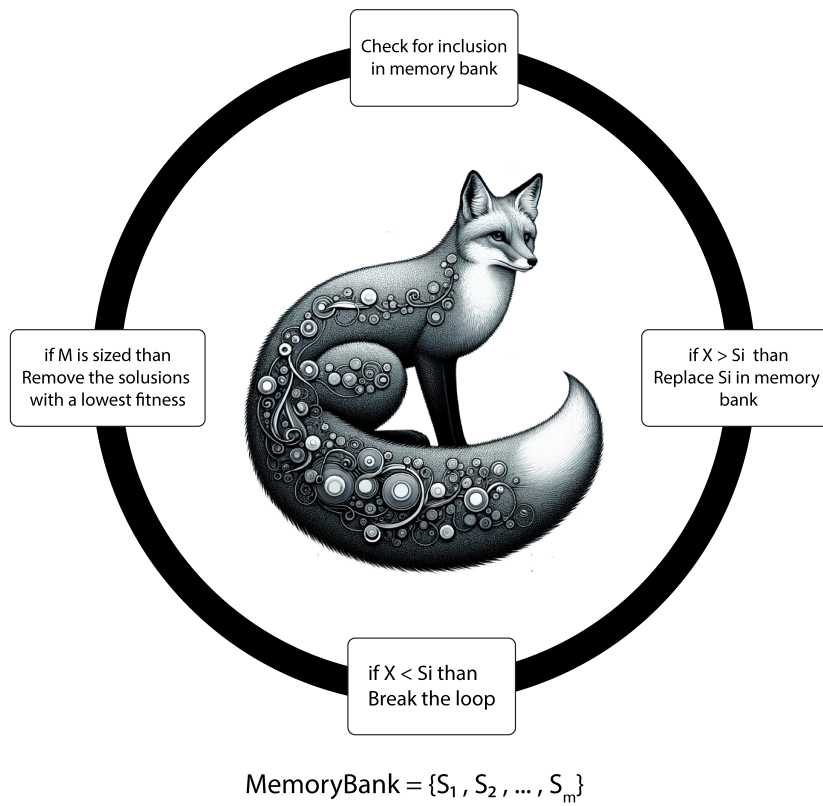
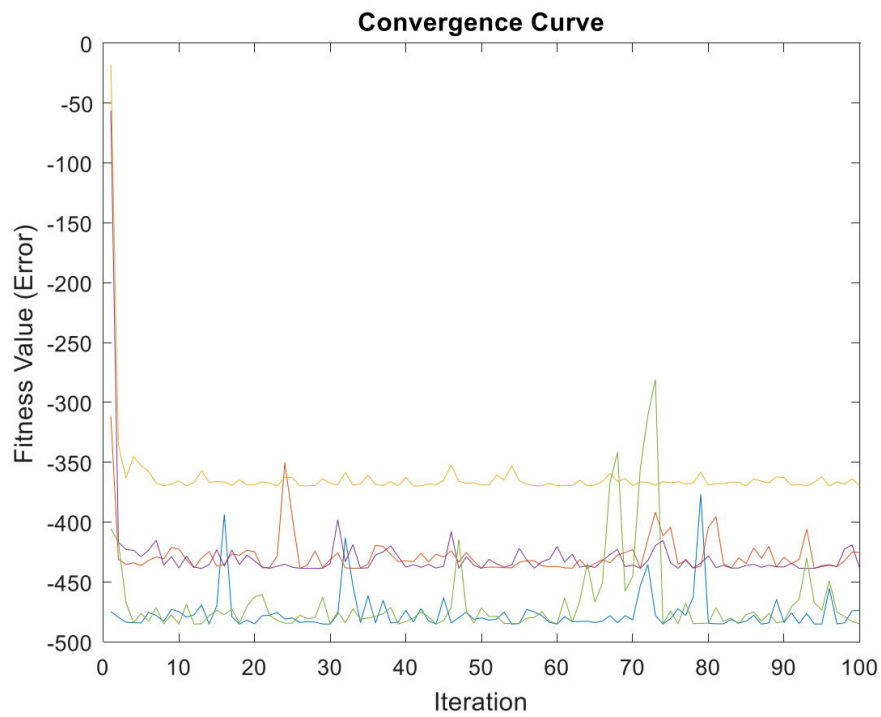
Abstract

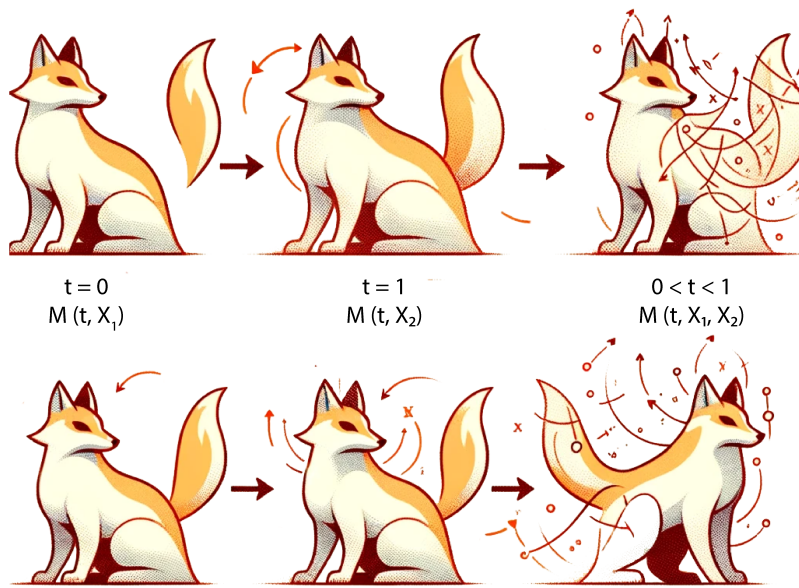
The Kitsune Optimization Algorithm (KOA), inspired by the mythical Kitsune, introduces a transformative approach in the realm of metaheuristic optimization. This paper presents an in-depth analysis of KOA, underlining its exceptional capabilities in terms of enhanced convergence speed, accuracy, and robustness. Empirical results from 12 benchmark functions along with optimizing power output in Photovoltaic (PV) systems reveal KOA's rapid convergence capabilities, significantly reducing computational time. In comparison to established algorithms, KOA shows a marked improvement in convergence speed, reaching optimal solutions faster by an average of first 5 iterations. In terms of accuracy, KOA demonstrates an impressive ability to locate global optima with a lower average error margin of 98 %, indicating a substantial increase in solution precision over traditional methods. This level of accuracy is particularly evident in complex multi-modal landscapes, where KOA consistently outperforms its counterparts. Furthermore, KOA exhibits exceptional robustness across various test scenarios, maintaining consistent performance and exhibiting a high level of stability. This robustness is further evidenced in real-world applications, such as the optimization of power output in Photovoltaic (PV) systems, where KOA adapts effectively to dynamic environmental conditions, showcasing its practical applicability and reliability. Overall, the Kitsune Optimization Algorithm sets a new benchmark in the field of metaheuristic algorithms with its enhanced convergence speed, superior accuracy, and robustness, making it a promising tool for tackling complex optimization problems in diverse domains.

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Kitsune Optimiser Algorithm (OKBA FERGANI Article).docx available at <https://authorea.com/users/758718/articles/732898-kitsune-optimiser-algorithm>

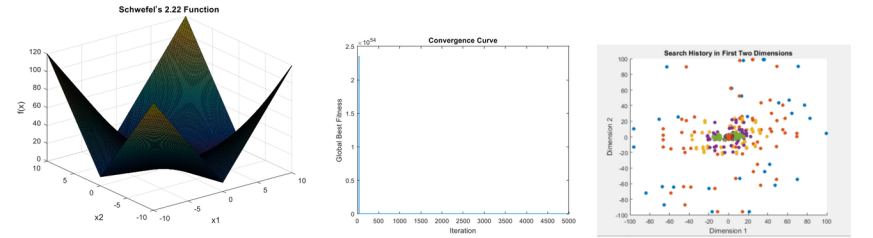
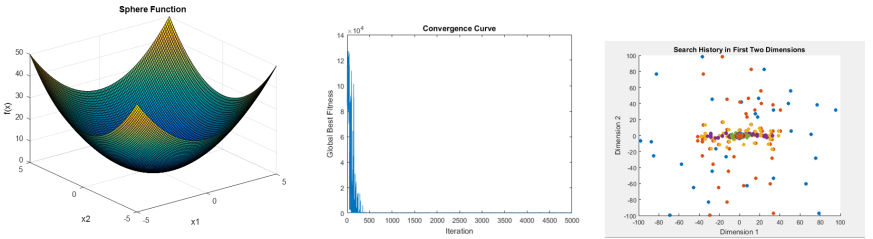
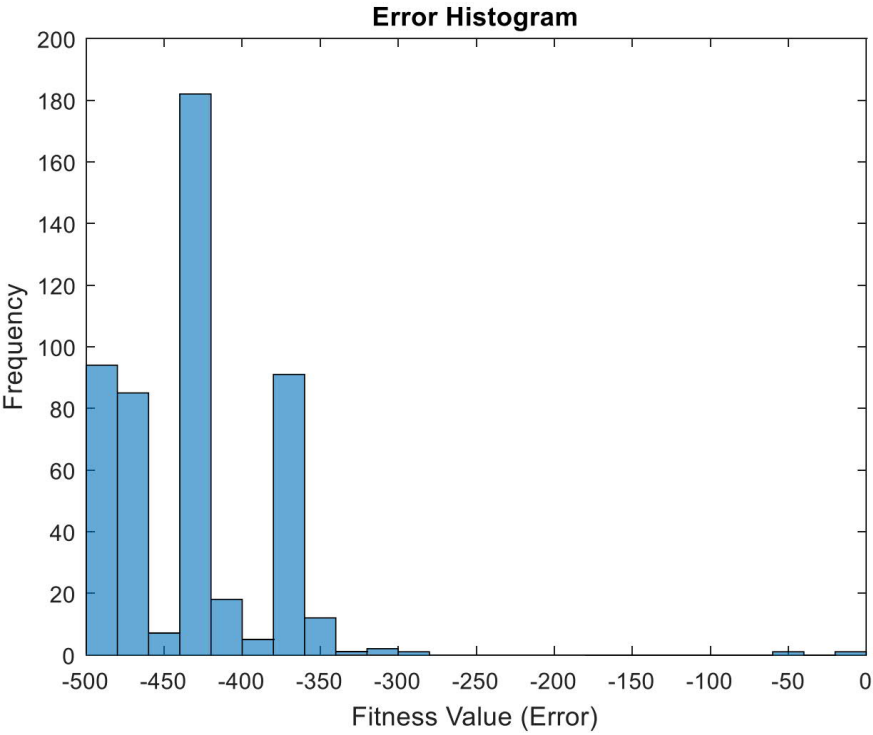


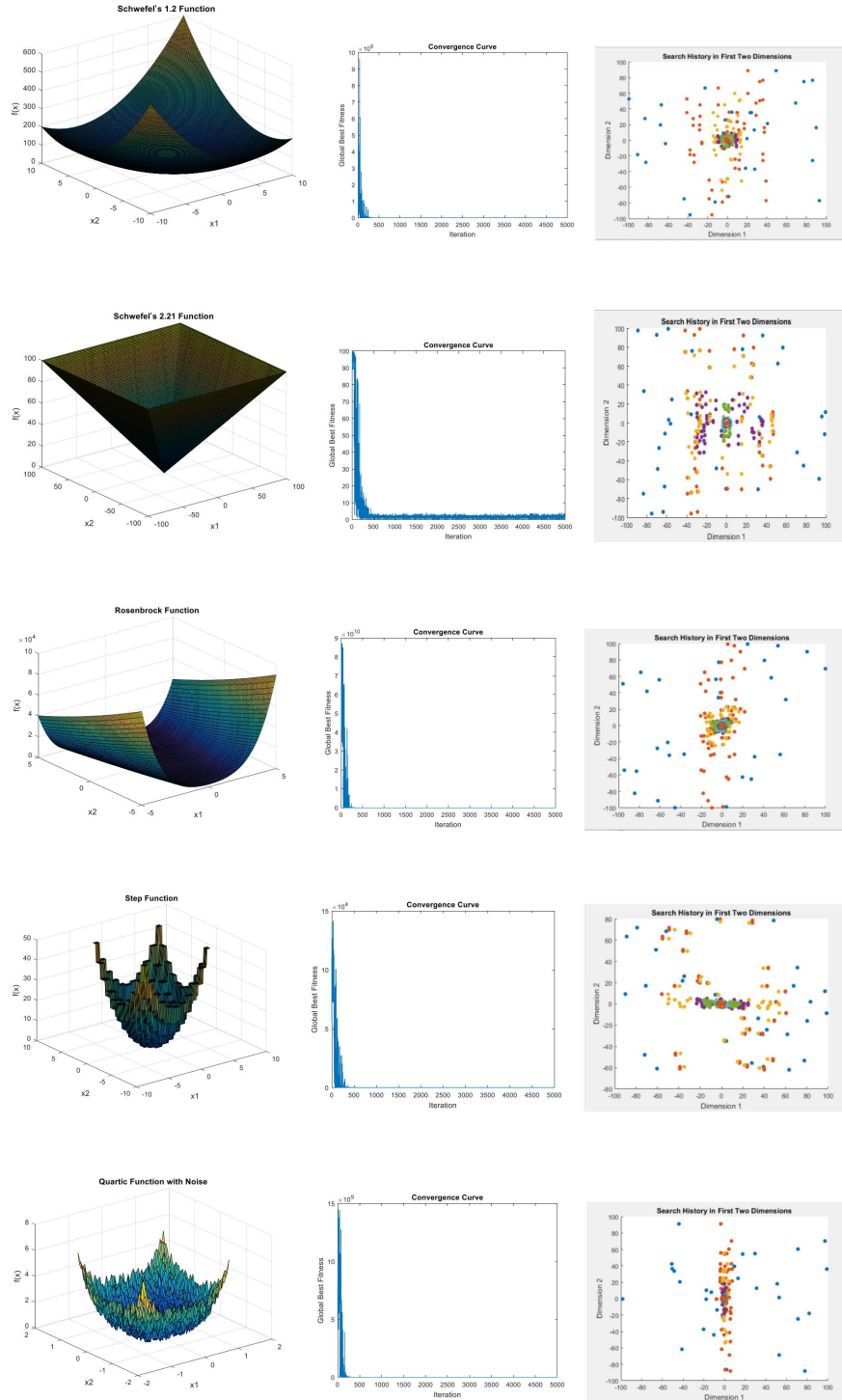


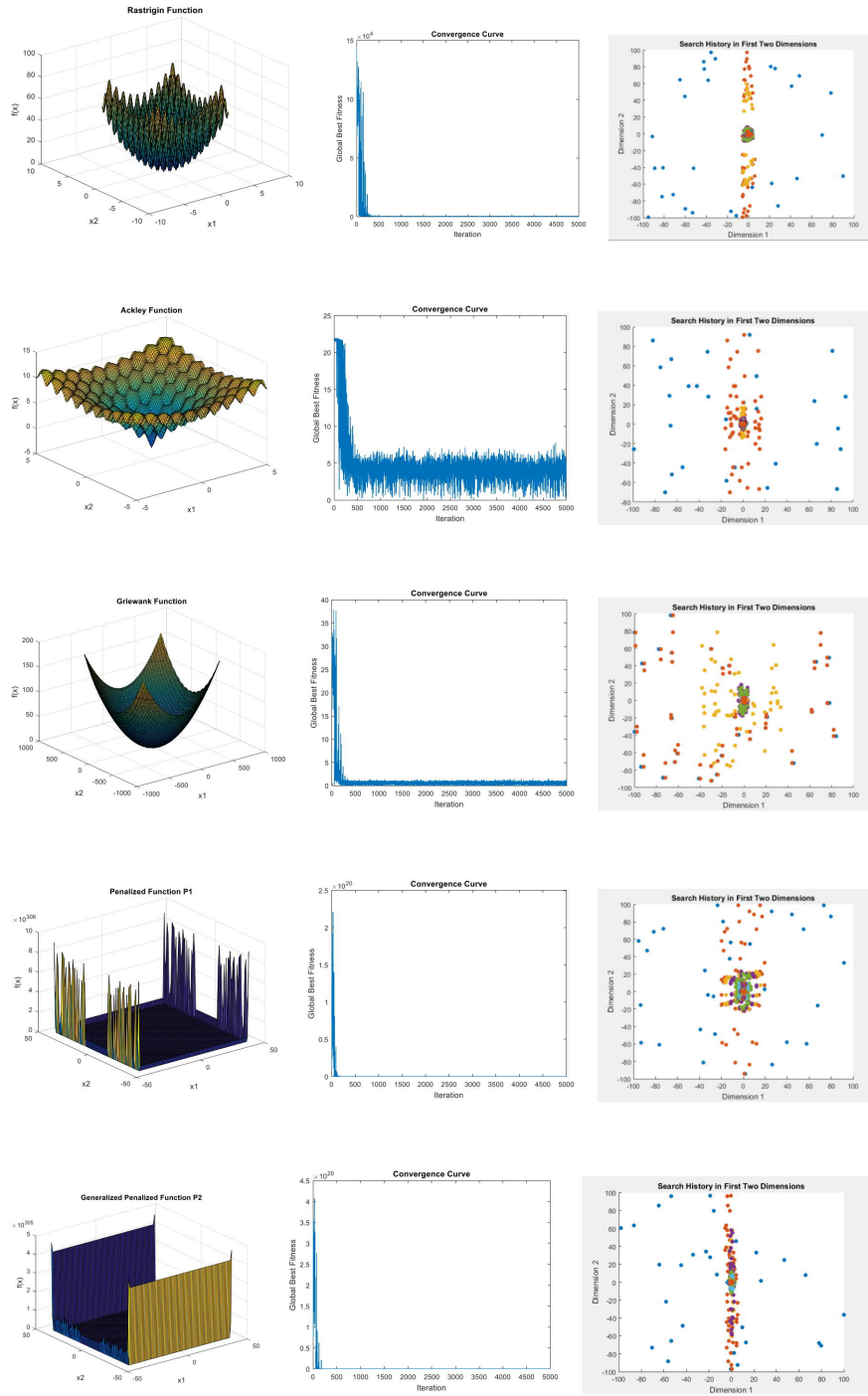


Morphing Equation

$$M(t, X_1, X_2) = (1-t) \times X_1 + t \times X_2$$







```
Initialize population of candidate solutions  
Initialize memory bank  
while termination criteria not met:  
    for each candidate in population:  
        Evaluate fitness of candidate  
    Update memory bank with best solutions  
    for each candidate in population:  
        Apply Intelligence Mechanism (I) to candidate  
        Determine Exploration (E) and Exploitation (X) actions  
        Update candidate position based on E and X  
    Check termination criteria  
Return best solution found
```

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Table (OKBA FERGANI).docx available at <https://authorea.com/users/758718/articles/732898-kitsune-optimiser-algorithm>