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<p>Professor Jia Heming is an outstanding academic talent at Sanming University. He holds a doctoral degree in Systems Engineering from Harbin Engineering University and has completed postdoctoral research in Mechanical Engineering. He has been selected into the list of the world's top 2% scientists (Stanford List) and the "2024 CNKI China's Top 1% Highly Cited Scholars" list. At the local level, he is rated as an Excellent Teacher in Sanming City. In the academic community, Professor Jia is actively involved in various activities. He is a council member of the Fujian Artificial Intelligence Society and the Fujian Computer Society. He also holds important editorial positions in several academic journals. He is an editorial board member of the SCI-indexed journal "Biomimetics", an editorial board member of the EI - indexed journal "Information", an assistant editorial board member of the Chinese core journal "CAAI Transactions on Intelligent Systems", a young editorial board member of the Chinese core journal "Journal of Frontiers of Computer Science and Technology". He is the director of the Artificial Intelligence and Information Fusion Application Innovation Research Center of Sanming University, a "Golden Phoenix Young Scholar" of Sanming University, and has been awarded the title of "My Favorite Teacher" of Sanming University. In terms of scientific research achievements, as the first author and corresponding author, he has published more than 100 scientific research papers, among which more than 70 are included in SCI, and 7 papers are selected as ESI highly cited papers. He has proposed original intelligent optimization algorithms, such as the Remora Optimization Algorithm, the Crayfish Optimization Algorithm, the Catch Fish Optimization Algorithm, and the Superb Fairy-wren Optimization Algorithm. His research results cover fields such as intelligent optimization algorithms, multi-objective evolutionary algorithms, machine learning, and feature selection, and have had an important impact on related academic and technical fields.</p>		
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Speech Title (English):		
Swarm Intelligence Optimization Algorithms and Engineering Application		
Speech Abstract		

Swarm intelligence optimization, inspired by the collective behavior of biological populations, has emerged as a pivotal domain in computational intelligence, providing efficient solutions for complex optimization challenges. This report introduces several novel swarm intelligence algorithms, each drawing inspiration from unique biological behaviors. The Remora Optimization Algorithm (ROA) emulates the symbiotic relationship between remoras and sharks, enabling effective global exploration and local exploitation. The Crayfish Optimization Algorithm (COA) is modeled after the foraging and migration behaviors of crayfish, striking a unique balance suitable for diverse optimization scenarios. The Catch Fishing Optimization Algorithm (CFOA) mimics the group - hunting behavior of fish, endowing it with strong global search capabilities. The Superb Fairywren Optimization Algorithm (SFOA) incorporates the social and mating strategies of superb fairywrens, leveraging information sharing and competition for efficient optimization. These algorithms collectively expand the theoretical framework of swarm intelligence, offering innovative perspectives on solving optimization problems.

In the realm of engineering applications, an improved version of the Remora Optimization Algorithm has been successfully applied to hyperspectral image band selection. Hyperspectral images, characterized by a multitude of bands, require efficient band selection to reduce dimensionality while maintaining classification accuracy. The enhanced ROA, with its improved search efficiency and convergence speed, has effectively identified the optimal band combinations, significantly boosting the performance of hyperspectral image analysis in practical applications such as land cover classification and environmental monitoring. These new algorithms and their applications not only enrich the optimization algorithm family but also underscore the potential of swarm intelligence in addressing real - world engineering issues. Future research could focus on further refining algorithm performance, exploring a broader range of engineering applications, and conducting in - depth theoretical investigations.