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Topic: Optimizing Hyper-parameters for Deep Learning Using Meta-Heuristic Algorithms

ABSTRACT. Deep learning (DL) is one of the most emerging types of contemporary machine learning techniques that mimic the cognitive patterns of animal visual cortex to learn the new abstract features automatically by deep and hierarchical layers. Hyper-parameter optimization is a model selection problem that attempts to find the best solution among a combination set of parameters with an aim to attain high accuracy. However, the trial and error methods to optimize the hyper-parameters take a very long time to test the accuracy given that there are many variables and some of their numerical data types are continuous. In this talk, we discuss an architecture that can be used for optimizing the hyper-parameters of neural network using metaheuristics. The comparison results of using meta-heuristic methods and traditional exhaustive search method would be presented. The novelty of applying the swarm search methods for finding the best hyper-parameters would be demonstrated. The pros and cons of swarm search methods for hyper-parameter optimization would be discussed, as well as pointing out some future directions of the hyper-parameters optimization.

Biodata:

Simon Fong graduated from La Trobe University, Australia, with a 1st Class Honours BEng. Computer Systems degree and a PhD. Computer Science degree in 1993 and 1998 respectively. Simon is now working as an Associate Professor at the Computer and Information Science Department of the University of Macau. He is also one of the founding members of the Data Analytics and Collaborative Computing Research Group in the Faculty of Science and Technology. Prior to his academic career, Simon took up various managerial and technical posts, such as systems engineer, IT consultant and e-commerce director in Australia and Asia. Dr. Fong has published over 300 international conference and peer-reviewed journal papers, mostly in the areas of data mining and optimization algorithms.