

Automatic Machine Learning with Metaheuristics

Machine learning has received unprecedented focus in recent years due to its ability to create intelligent systems that assist us in our daily life. Deep learning belongs to the broader family of machine learning models based on artificial neural networks. Deep learning approaches have outperformed in various areas of computing, from image processing to natural language processing and medical imaging. Machine learning also assists in numerous medical diagnosis tasks such as automatic disease diagnosis, report generation, cancer staging, and disease prognosis. A key issue with these algorithms is fine-tuning hyperparameters and designing deep learning architectures requiring human expertise. Metaheuristics can be combined with AI techniques to build powerful algorithms which assist in building Automatic Machine Learning (AutoML) systems for healthcare and other domains. AutoML is designed to enable domain experts to automatically build ML applications without much requirement for statistical and ML knowledge. I am working on designing AutoML algorithms for medical image diagnosis and other tasks in this thesis. Currently, I have proposed an approach for designing Convolutional Neural Network (CNN) architectures using genetic algorithm for medical image classification task.