

**CSE 573: Computer Vision and Image Processing (Spring'24)****Semester Project Early Plan**

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**Team Details**

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**Project Details**

**Project Title:**

Meta-Heuristics vs. Backpropagation: A Fresh Look at CNN Model Parameter Optimization for Image Classification

**Abstract:**

Most of the Neural Network models are trained using gradient based backpropagation technique to optimize model parameters which are prone to be stuck at local optimal value rather than reaching the globally optimal parameters. There are various techniques to improve the simple Stochastic Gradient Descent (SGD) like Learning Rate Scheduling and Momentum, but these techniques does not resolve the aforementioned limitation. In this project, we aim to compare Backpropagation with Meta-Heuristic Optimization Algorithms by analyzing their performance on training CNN models for Image Classification tasks. There are a few population-based meta-heuristic algorithms like Particle Swarm Optimization (PSO) and Grey Wolf Optimization (GWO) which can achieve globally optimal parameters and so, we aim to check the feasibility of such optimization techniques in CNN model architectures.