# Automated Model Selection and Hyperparameter Optimization Using Bayesian Optimization

## Research Statement

This research focuses on the automation of machine learning model selection and hyperparameter tuning using Bayesian Optimization. The study aims to enhance predictive performance and reduce manual intervention in model development by employing probabilistic models to efficiently explore the hyperparameter space. Through intelligent sampling and evaluation, Bayesian Optimization provides a systematic approach to find optimal configurations with fewer evaluations compared to traditional methods. This research seeks to demonstrate how such automation can accelerate model development, improve accuracy, and support robust decision-making in various machine learning applications.