Computational models of paper titled "Effect of Silver Nanowires Morphology and Concentration on Conductive Films: A Machine Learning-Driven Explainable Analysis " by Du Y. submitted to *Materials Letters*

Overview

This repository is generated for our study that focuses on the synthesis of silver nanowires (AgNWs) with controlled aspect ratios to fabricate conductive films with tunable electrical properties. Specifically, our work addresses three key questions. (i) Machine learning (ML) models, including Random Forest, XGBoost, and Kernel Ridge Regression, are developed to establish the relationship between AgNWs morphology, concentration, and the performance of conductive films. These models provide valuable insights and enable feature importance analysis, helping to understand how these variables affect sheet resistance. (ii) Integrating ML models with predicative analysis, the study identifies the most accurate models for forecasting film performance. (iii) This study also offers practical guidance for optimizing fabrication parameters by predicting the effect AgNWs morphology and concentration on resistance.

Detailed description of our code is provide in the shared ipynb file.