Final Report

The "Pollen's Profiling" system successfully demonstrates the feasibility of using machine learning to automate the classification of pollen grains with high accuracy and efficiency. Through meticulous preprocessing, model selection, and optimization, the system achieved state-of-the-art results in identifying various pollen types from microscopic images.

This project proves valuable in three key domains:

1. **Environmental Monitoring**: Assisting ecologists in tracking pollen distribution and biodiversity changes.
2. **Allergy Diagnostics**: Supporting allergists in identifying allergens quickly for targeted treatments.
3. **Agricultural Research**: Enabling agronomists to study pollination dynamics and improve crop yields.

Future work includes expanding the dataset to cover more species, enhancing real-time processing for field deployment, and integrating mobile app support. This prototype lays the groundwork for impactful applications across research, healthcare, and farming ecosystems.