ECCE 633 – Machine Vision and Image Understanding
Final Project

Announced: **7 October 2021**

Project Selection: **14 October 2021**

Submission deadline: **8 December 2021**

Acceptable forms of submission:

Online: report, presentation slides, and source code (using Blackboard)

In the final project, you'll study an area of computer vision in significant depth. All projects should involve reading research literature, implementing a computer vision system, evaluating that system, and comparisons with the literature. Projects can be done individually or in teams of two. You should outline the tasks from each team member in your project selection statement (expected tasks), and the final report.

Submission Material: You should submit a report and deliver a 10-minutes presentation that shows your implementation of the one the following projects.

1. Use a combination of convolutional neural networks and local binary patterns for hyperspectral image classification.
   Wei, Xiangpo, Xuchu Yu, Bing Liu, and Lu Zhi. "Convolutional neural networks and local binary patterns for hyperspectral image classification." European Journal of Remote Sensing 52, no. 1 (2019): 448-462.

2. ICPR 2020 challenge problem: Develop a system for automatic classification of pollen grain images.
   https://iplab.dmi.unict.it/pollenclassificationchallenge/

3. ISBI 2021 challenge problem: Retinal image analysis for multi-disease detection challenge.
   https://riadd.grand-challenge.org/

4. Other Topics: Students are encouraged to suggest a topic of their interest. Example problems include topics like image enhancement, inpainting, compression, and denoising. Projects that overlap with your research are generally fine.

It’s not expected to test the performance on all datasets and experiments mentioned, you can also test your proposed model on similar datasets you find.

Please submit your project choice by the project selection date mentioned earlier. If you are part of a team, include the names of your team members and outline expected tasks.

If you choose project 4, include a short description of the problem you plan to solve, your proposed approach, evaluation metrics, and references to the literature (less than one page is fine).

The specifications of the final report are as follows:
- Maximum of 10 pages (do not include appendices; you can add as many appendices as you need)
- 12 pt font with 1” margins
- in 1~2 pages describe the problem
- in 2~4 pages describe the method and the technical ideas in your selected project.
- in 2~4 pages describe your experimental setup and provide an analysis of the performance of the developed model and its different components, comparisons with the literature, and suggestions for future developments.