

ECE 552 VISUAL PERCEPTION FOR AUTONOMY
Department of Electrical and Computer Engineering
University of Dayton
Spring 2026

Project 2
(Due Date: 02/11/2026)

1. (a) Write a program to perform AINDANE (*Adaptive and Integrated Neighborhood Dependent Approach for Nonlinear Enhancement*) based nonlinear enhancement algorithm for visibility improvement of color images. You can use the MATLAB codes provided for implementation, testing and evaluation.

(b) Display the original images and the enhanced images.

(c) Repeat the experiments for several input images (at least 6) with different levels of complexities (*extreme dark regions and bright regions in the image*).
2. (a) Perform a qualitative assessment of the image enhancement technique (*AINDANE*) and compare the performance with the classical histogram equalization methods (*HE and AHE*).

(b) Display graphical illustrations of the quantitative assessment (*image mean vs mean of regional/zonal standard deviation*) of enhanced versus original images using AINDANE, and compare the performance with the classical histogram equalization methods (*HE and AHE*).

Notes:

- The project should be implemented in MATLAB or Python.
- You may use the sample codes provided in the Resources folder of Canvas.
- The program outlines with flow chart and equations used, implementation results with sample data sets and the obtained results should be submitted through Canvas for evaluation.
- The program codes along with the dataset used for testing and validation should be submitted through Canvas for evaluation.
- Late submissions will not be accepted.