Bishop's University

CS563-463 Fall 2025

Computer Vision-Image processing

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Final project-Mean Shift

Management

Name: Mean Shift

Posting date: 2025-27-11

Delivery date: 2025-12-19, midnight

Name the file as: Final Project_MeanShift_$TeamName

Production: A soft document (pdf) for the report. A program for the implementation

Team members

Last name	First name	ID	Email

Objective

The objective of this project is to implement and to experiment the Mean Shift technique for image filtering (smoothing) and image segmentation.

Requirements

The requirements below intend to specify what is to be done, but not how it should be done. The student should consider various design decisions for constructing the smoothing and segmentation program using the mean shift algorithm. Here how the program should work.

- The program should give a brief greeting and announce its purpose
- The program should prompt the user for its input (image)
- The program should prompt the user for the desired application to use, filtering (smoothing) or segmentation
- The program should prompt the user for the following input parameters:
    - Filtering: hs (Width of colors-gray level), hs (of the space or localisation, x and y)
    - Segmentation: hs, hr, M (the minimum number of pixels to eliminate a region)
- The program should be able to automatically select the required feature to use, namely localization (x,y) in addition to color (for color images ppm - 5 dimensions data) or gray scale intensity (for pgm images - 3 dimensions data). Your solution must work for both gray scale and color images.
- The program should display the resulting image
- Important program steps must be clearly described. Program code or tools used, developed by others, should be documented. Code from previous assignments can be used. The core of the segmentation part and the smoothing part (i.e. Mean Shift) must be your own code.
- A document/report must be submitted that shows the use of the program, the results, and some discussion of the results.

Resources

Example test data files are provided.

Submission: report + program

You will submit 2 files:

File1: The Software program

It contains the source code of your programming work, of type *.py. If many files, provide a zipped content with a How to use file that includes the team information, name of the team and students identification.

File2: Reports on methods and results

A report of maximum 3 pages that explains your work. The report must be in pdf. This report must have the following sections: 1) identification of person and assignment, 2) brief problem definition, 3) summary of choices made for the solution, 4) Smoothing and segmentation results, 5) brief discussion of results. As a guideline, a well done report need only be 2 typed pages in addition to the pages showing the example results.

Moodle

A link will be open on Moodle for Submission
Group work is accepted. Maximum number of students in a team is three.
Only one student of the group will do the submission.

Notes

Partial credit will be given for partial completion of the tasks. Thus, it is wise to always have a version of the program that correctly computes some of the required outputs.

It is unwise to work with large input images until the program steps are working correctly. It is too difficult to determine problems with large images.

Good luck and remember that any part of this final project can be discussed with the instructor for more clarifications and hints.