

Bishop's University

CS563-463 Winter 2025

Computer Vision-Image processing

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Intelligent Scissors

Management

Name: Intelligent scissors

Posting date: 2025-10-27

Delivery date: 2025-11-10, midnight

Name the file as: Assignment3IntelligentScissors_ \$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 assignment is to implement and study the intelligent scissors algorithm for manual image segmentation.

Requirements

You need to implement a segmentation program based on intelligent scissors. The program allows the user to manually input seed and free points. The program then automatically generates the edges links. The figures below show sample gray scale images that your program takes as input (Figure 1) and should produce as output(Figure 2).



Figure 1: input image



Figure 2: Output binary image

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 segmentation program. 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 must allow the selection of seed and free points
- The program must display in real time the edges found by the program
- The program should generate as output a binary image resulting of the segmented object (foreground for the contours and background for the remaining pixels)
- 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. Libraries can be used to read/display/write image files, to select seed and free points, to perform convolution operations, and to find the shortest path for Dijkstra's Algorithm. The rest of the work should be yours. It is forbidden to use an already built intelligent scissors function.
- 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 will be provided.

Submission: report + program

You will submit 2 files:

File1: The Software program

It contains the source code of your programming work. 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) 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.