



Università
della
Svizzera
italiana

Faculty of
Informatics

Institute of
Computing
CI

Numerical Computing

2022

Student: FULL NAME

Discussed with: FULL NAME

Solution for Project 5

Due date: Wednesday, 7 December 2022, 11:59 PM

Numerical Computing 2022 — Submission Instructions

(Please, notice that following instructions are mandatory:
submissions that don't comply with, won't be considered)

- Assignments must be submitted to iCorsi (i.e. in electronic format).
- Provide both executable package and sources (e.g. C/C++ files, Julia). If you are using libraries, please add them in the file. Sources must be organized in directories called:
Project_number_lastname_firstname
and the file must be called:
project_number_lastname_firstname.zip
project_number_lastname_firstname.pdf
- The TAs will grade your project by reviewing your project write-up, and looking at the implementation you attempted, and benchmarking your code's performance.
- You are allowed to discuss all questions with anyone you like; however: (i) your submission must list anyone you discussed problems with and (ii) you must write up your submission independently.

The purpose of this assignment is to gain insight on the theoretical and numerical properties of the Conjugate Gradient method. Here we use this method in an image processing application with the goal of deblurring an image given the exact (noise-free) blurred image and the original transformation matrix. Note that the “noise-free” simplification is essential for us to solve this problem in the scope of this assignment.

1. General Questions [10 points]

2. Properties of A [10 points]

3. Conjugate Gradient [30 points]

4. Deblurring problem [35 points]