

|   |                                 |
|---|---------------------------------|
| Università<br>della<br>Svizzera<br>italiana | Institute of<br>Computing<br>CI |
|   |                                 |

High-Performance Computing Lab

Institute of Computing

Student: FULL NAME

Discussed with: FULL NAME

---

## Solution for Project 4

---

**HPC Lab — 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, Matlab). 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.

1. Task: Ring maximum using MPI [10 Points]
2. Task: Ghost cells exchange between neighboring processes [15 Points]
3. Task: Parallelizing the Mandelbrot set using MPI [20 Points]
4. Task: Parallel matrix-vector multiplication and the power method [40 Points]
5. Task: Quality of the Report [15 Points]