Verification of Neural Networks Competition @ FMI - UVT

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1 General Information

Teams formed will work for this competition in the second part of the semester, after we finish discussing the theoretical part.

There are 2 tracks for the competition. Your team can compete in one of them.

1. Reproduce and understand the results from the VNN-COMP 2023[1] for a certain benchmark which deals with computer vision.

2. Take the benchmark proposed by [1], understand the penalties of the tools from the VNN-COMP 2023 and fix them.

The competition is actually the final exam. It consists of a presentation (presented in the day of the exam) of the challenge you solved and a demo. Additionally,

- a group report of 5 pages and

- an individual reflective report of 1 page

should be uploaded.

Presentation and reports must be written in Latex (Beamer). The structure of the presentation and of the 5 pages report must follow the well-known rules[2].

Projects without a demo are not taken into consideration. Reports generated with LLMs are also not taken into consideration. Each report should include the github link for your project which should be weekly updated until the exam.

The reflective report should contain the following information:

- What did you learn from this course? Do you think you can apply this to other courses/university project and/or in real life?

- What was the most valuable thing you learned?

- What skills and concepts are you most confident about at the end of the semester?

- What was the general feeling about this subject (both theory part and the second part including the preparation of the project)?

- To which part have you contributed in the project? How difficult were the tasks you have been involved? How was the communication and collaboration with the other team members.

More details about the reflective report can be found here `https://merascu.github.io/links/utils.html`

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[1]`https://github.com/ChristopherBrix/vnncomp2023_results`

[2]Refresh your knowledge on writing or giving scientific papers, respectively papers by checking `https://merascu.github.io/links/Resources/guide_thesis_bachelor_master_v2.pdf` and `https://merascu.github.io/links/Resources/TemplateBachelorMasterPresentation.zip`

2   Draft version of the report

It should contain:

- Description of the dataset you used (30%).

- Installation of the tool used (20%).

- Run of one tool for the benchmark (40%).

- Structure and quality of report (there should be a flow/story of the presentation, take care of English/Romanian usage, etc.) (10%)

3   Final version of the report

It should contain (start 1 point):

- The items from the draft version modified based on feedback (30%)

- Weekly commits on github (10%)

- Reproduce the results for 1 benchmark and 2 tools dealing with computer vision as presented in `https://github.com/ChristopherBrix/vnncomp2023_results` (30%).

- Understand the penalties (10%). Fix the penalties (10%).

- Structure and quality of report (there should be a flow/story of the presentation, take care of English/Romanian usage, etc.) (10%) .

4   Final presentation

Final presentation will be graded based on the following criteria (start 1 point):

- Structure and quality of slides: 30%

- Demo application (use of relevant test data) (link Github): 20%

- Quality of oral presentation by the student 30%

- Answers to the questions (approx. 2 questions): 20%

References

[1] Andreea Postovan and Mădălina Eraşcu. Benchmarking local robustness of high-accuracy binary neural networks for enhanced traffic sign recognition. In Horaţiu Cheval, Laurenţiu Leuştean, and Andrei Sipoş, editors, Proceedings 7th Symposium on *Working Formal Methods,* Bucharest, Romania, 21-22 September 2023, volume 389 of *Electronic Proceedings in Theoretical Computer Science*, pages 120–130. Open Publishing Association, 2023.