image & video understanding

Your Project Title

Project Proposal

IVU Practicals (710.241)

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This document provides all details about what to include for each of the written IVU deliverables. **Read this document carefully!**

1   Important: Safeguarding Good Scientific Practice

All students of TU Graz have to follow the official *Guidelines on Safeguarding Good Scientific Practice*[1] throughout the course. In particular, this means that sources **must be cited correctly** and plagiarism will not be tolerated.

- **For the proposal, report & presentation**, ensure that you cite related works, image sources, *etc.* as you would do in a Bachelor's or Master's thesis.

  For example, "*we use foo filters [2] and evaluate the results via frobnication metrics [1]*".

  If you need a refresher on proper citing, refer to the *Guidelines for Scientific Writing & Presenting*, available at the IVU TeachCenter[2].

- **In your implementation**, ensure that you properly credit code snippets which are not your own work.

  For example, answers posted on `stackoverflow` are available under a CC license[3] and must be attributed accordingly.

2   Deliverable #1: Proposal (11.11.2022)

The proposal should be a ~ 2 page document which addresses:

1. Project description.

2. A simplified project plan.

3. Risk analysis.

2.1   Project Description

Briefly summarize what you are going to implement. This should include a specification of the inputs & outputs of your application and the overall setting/setup. For example, for a "blackboard digitizer" this could look like:

> *The user captures the blackboard (which shows an equation) with a smartphone camera and uploads an image to our web service. Our system processes this single image and outputs the corresponding LaTeX typesetting commands.*

2.2   Project Plan

The (simplified) project plan ensures that you *think-before-you-code*. Jumping right into coding without fully understanding the problem or considering alternative potential solutions is a major risk for any software development process, even more so in a research-heavy domain such as computer vision. Thus, you have to **list 6 milestones**[4], each including:

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[1]See TU4U: `https://tu4u.tugraz.at/fileadmin/public/Studierende_und_Bedienstete/Directives_and_regulations_of_TU_Graz/Safeguarding_Good_Scientific_Practice_Guidelines.pdf`

[2]IVU TeachCenter, direct download link: `https://tc.tugraz.at/main/mod/resource/view.php?id=205813`

[3]In particular, CC BY-SA 4.0: `https://creativecommons.org/licenses/by-sa/4.0/`

[4]Minimum requirement - if you want, you can specify more.

- **What will be achieved once you reached this milestone?**
  This should be a *specific & measurable* goal, such as "evaluated 3 publicly available approaches"; "processed the first custom recorded image/video"; "finished the report", *etc.*

- **When will the milestone be reached?**
  Specify the date or calendar week when you expect this milestone to be finished.

- **Who is responsible?**
  Each milestone has a task/milestone leader who is responsible to achieve it on time.

- **Who contributes how much/what?**
  Either assign tasks to group members explicitly or put an estimate (percentage of the milestone's tasks). For example:

  - "*Person A implements the data loader; B annotates N images; C implements the evaluation metric*", or
  - "*A: 40 %, B: 40 %, C: 20 %*".

2.3   Risk Analysis

To avoid running into a dead end, you should always conduct a risk analysis (thinking about critical *what-if* scenarios) before you start a project. For IVU, **identify 3 potential (realistic) risks and your mitigation strategy**. For each, include:

- **What could go wrong?**
  Short description of the risk. For example, "*available compute ressources are insufficient*" or "*training dataset is too small*", *etc.*

- **Risk assessment**
  Rate on a scale of {*low, medium, high*}, a) how likely this risk will occur & b) how severe it would be.

- **Mitigation strategy**
  Briefly describe an alternative solution, *i.e.* what you would do if this situation really happens to ensure that you will be still able to finish the project.

3   Deliverable #2: Report (20.01.2023)

The final report should be a ~ 5 page document which addresses:

1. Application description.

2. Updated project plan.

3.1   Application Description

The majority of the final report should be the description of what you actually implemented, including:

- Which approaches/tools/*etc.* did you use to build your application?

- Which data did you use/record/annotate/train & evaluate on/*etc.*

- How well does your application perform/where does it fail?

- Which of your initial project goals (planned functionalities) were successfully implemented; which were not?

3.2   Updated Project Plan

Compare the initially planned milestones with their actual achievement date:

- If the dates differ, provide a brief explanation why or how this affected your project.

- If the responsibilities/contributions changed throughout the implementation phase, state these changes.

- If you had to overcome unforeseen challenges, add a brief description (and what you did to mitigate those).

Grading Remarks:

- Unless your actual contributions are extremely unbalanced (*e.g.* a group member drops out or did not contribute their assigned tasks), all group members will get the same grade.

- We will not grade how closely the actual schedule matches your initial estimate. The IVU practical course is about gathering hands-on experience, which includes learning that realistic scheduling of a CV/ML project can be challenging.

References

[1] Richard Everyman, Mary Major, Joe Bloggs, and Jane Roe. Can a Machine Frobnicate? In *Proceedings of the International Foo Filter Symposium*, 2014.

[2] John Roe and Jane Doe. The Frobnicatable Foo Filter and its Applications. In *Proceedings of the Conference on Frobnication*, 2017.