Winter Term 2022

Computer Vision: 3D Reconstruction

Final Project

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How to find a suitable problem/task?

- Go through the slides or look into (recent) vision papers and pick a task or problem you find interesting
- Make sure the task is not too complex or out-of-scope

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- Make sure the task is not too complex or out-of-scope
- Find the right environment to design and validate a solution
  - Sufficient data available
  - Computing resources (https://colab.research.google.com/)
  - Evaluation protocol

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  - Sufficient data available
  - Computing resources (https://colab.research.google.com/)
  - Evaluation protocol
- Example tasks: image stitching, camera pose optimization, sparse reconstruction, face tracking, image generation, paper re-implementation

Goal: Work scientifically on a chosen vision task/problem

How to work on it?

1)Define your task and methodology

2)Collect or create data and the evaluation protocol to measure your success

3)Design and implement your solution

4)Run experiments and measure success

5)If adjustments are needed, go back to 3)

6)Write down the results and submit

Submission: What you need to hand in

1. Groups of 4
2. Submit your files and directories as a single zip-file
    1. Source code must include your implementation, documentation as *README.md* and a *demo.ipynb* to show and validate your results
        - Make sure to clean your code (in the end)
        - The demo.ipynb is strictly required and should present all major features of your solution/implementation
        - Look at some libraries, e.g. https://github.com/tqdm/tqdm, to get an idea of how to structure your project

Submission: What you need to hand in

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    1. Source code
    2. A written report (include your Matrikelnummer and field of study)
        1. Total of 6 – 8 pages including references
        2. Use the following latex template
           http://cvpr2021.thecvf.com/sites/default/files/2020-09/cvpr2021AuthorKit_2.zip
        3. Follow the structure of a typical scientific article
            - Abstract, Introduction & Related Work, Method (Your solution), Experiments, Findings, Conclusion

Criteria: How is your submission evaluated

The success of your project is evaluated by different criteria

1) Overall result → Did you achieve your project goal?

2) Realization → Did you come up with a reasonable approach/methodology?

3) Implementation → Did you demonstrate that and how everything works?

4) Report → Did you express your motivation, method, experiments and findings in written form?

NEXT SLIDES CONTAIN DETAILS FOR ORIENTATION

Criteria – Some Guidelines

Overall Results

- Did the students motivate a problem/task which their method can solve?
- Did the students present a solution?
- Did the students come up with experiments to validate their solution?
- Can they in the end evaluate the effectiveness of their solution and/or make suggestions on how to move forward?

Criteria – Some Guidelines

Realization

- Did the students provide their own solution? Are a lot of results already given?
- Is the research problem suitable in the context of a mini-project?
- Did the students put the focus on relevant aspects when designing their solution or experiments?
- Did the students base their method/experiments on correct assumptions, intuitions or theoretical foundations, etc.? Is it correct to solve the task as they propose?
- Clarity - Is the methodology consistent and logical?

Criteria – Some Guidelines

Implementation

- Is the code readable? Is it easy to browse through the implementation and to find relevant code? Does the code have a clean structure and design?
- Are all relevant parts of the method and experiments present in the implementation? → Demo notebook !!!
- Does it run? Does it reproduce results? Can it be validated? → Demo NB !!!
- Did the students provide sufficient documentation on top of their code to navigate and rerun their implementation, to find all relevant components and so on?

Criteria – Some Guidelines

Written Report

- Does the report have a clear structure? Does the report present all the essential parts of the students' project?
- Introduction, Motivation / Related Work, Conclusion must be included!
- Did the students explain their solution thoroughly and correctly such that important aspects are clarified?
- Did the students explain the set of experiments they conducted, their reason/goal and their setup?
- Readability, Overall Form and Quality of Figures are important!

Next Steps

1. Please assign yourself to one of the project groups on Moodle
2. Hand in 2-3 project proposals (max. 10 sentences each)
   - Make sure each of them addresses all points discussed on Slide 2
   - Deadline is 17.2.2022
3. Each group will be assigned a tutor
4. Submit your projects by 28.3.2022 on Moodle

Questions?

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