Exercise 0

The Team

Lecturers

Dr. Nikita Araslanov

TAs

Regine Hartwig

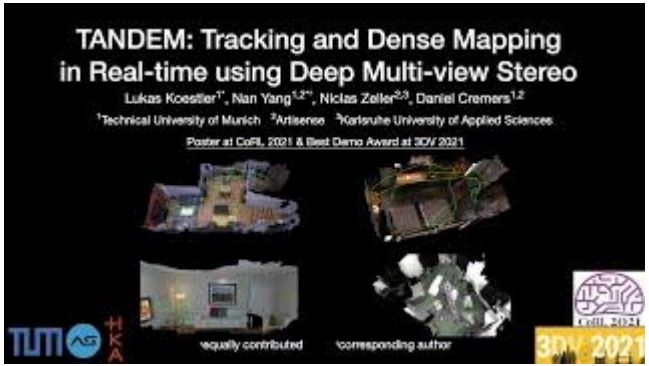
Dominik Muhle

Our Research Lab

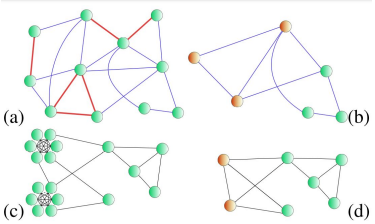
Computer Vision & Artificial Intelligence
Headed by

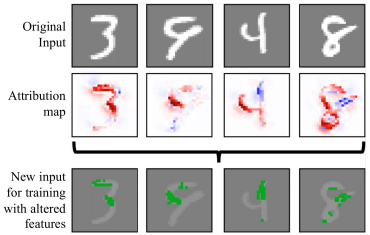
Prof. Dr. Daniel Cremers
https://cvai.in.tum.de/

Our Research Lab

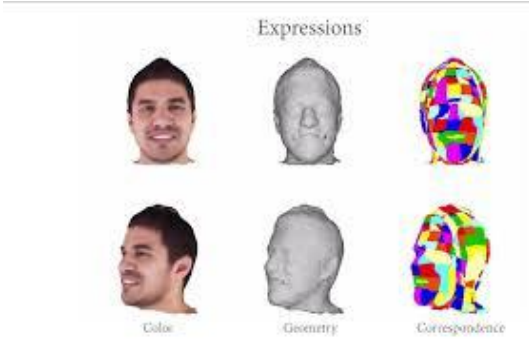


Visual SLAM/3D Reconstruction

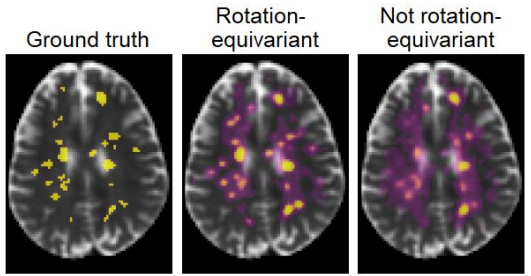




Deep Learning



Shapes



Miscellaneous

Our Research Lab

- Lectures
  - CV2 Multi-View Geometry
  - CV3 Detections Segmentation and Tracking (WS)
- Practical Courses (selection)
  - Geometric Scene Understanding
  - Hands-on Deep Learning for Computer Vision and Biomedicine
- Seminars (selection)
  - Advanced Topics in Graph Learning
  - Beyond Deep Learning: Selected Topics on Novel Challenges

Moodle

- Announcements via Moodle - IMPORTANT!
  - Sign up in TUM online for access: https://www.moodle.tum.de/
  - We will share common information (e.g., regarding exam)
  - Ask content questions online so others benefit
  - Don't post solutions

Emails & Slides

- All material will be uploaded on Moodle and the web
- Questions regarding the syllabus, exercises or contents of the lecture, use Moodle!
- Questions regarding organization of the course:

cv3-ws23@vision.in.tum.de

- Emails to the individual addresses will not be answered.

About the Exercise Session

- Every Thursday 8-10 starting from TODAY!
- Divided into classes and office hours
- Classes:
  - Present the solutions for the previous exercises (unrecorded)
  - Present the next exercise (recorded)
- Office hours:
  - Ask questions regarding the exercises
  - Either with Regine (02.09.035) or Dominik (02.09.58)

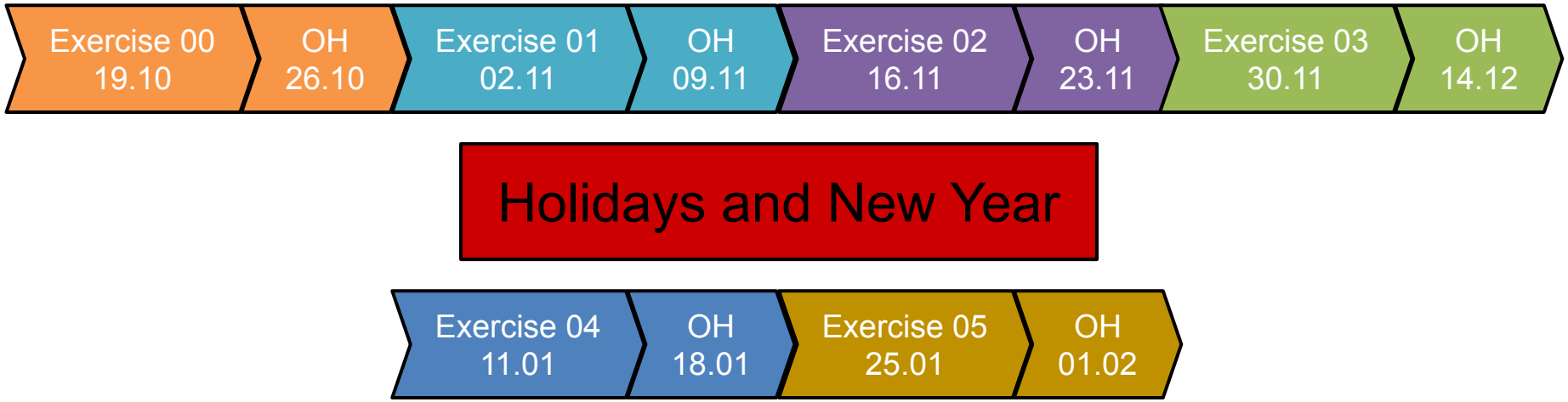
https://cvg.cit.tum.de/teaching/ws2023/cv

About the Exercise Session

- A course on Computer Vision
  - Object detection
  - Multiple object tracking in 2D and 3D
  - Instance and semantic segmentation
- 5 corresponding exercises over the whole semester + 1 introductory exercise
- Wait: This is more than last year => each exercise is smaller
- You only need to pass 4/5 exercises for the exam bonus

About the Exercise Session

- 2 weeks for each exercise + Office hours (OH) for questions in between



Deadline always 23:59 CET on due date

About the exercises

- Exercises provided similar to I2DL
- Each exercise contains all the code necessary for the exercise
- A jupyter notebook acts as the guide through the exercise and interface to the code
- All task are clearly marked
- Tests are provided for each task for you to validate your solution before submitting
  (passing the tests does not guarantee a successful submission)

Setting up the exercises

- download the folder structure (link on the last slide)
- download the datasets (link on the last slide)
- unzip the both zip files
- copy the content of datasets into the datasets folder in the folder structure
- for each individual exercise
  - download the code base with the link provided in the exercise slides/website
  - paste it into the respective folder

Exercises

- Exercise 0 (doesn't count) (**today**):
  - Get to know data and environment
  - Test the submission system
- Exercise 1 - Object Detection (02.11):
  - History of Oriented Gradients
  - Sliding Window Matching
- Exercise 2 - Hungarian Matching (16.11):
  - Data Association
  - Hard Triplet Mining

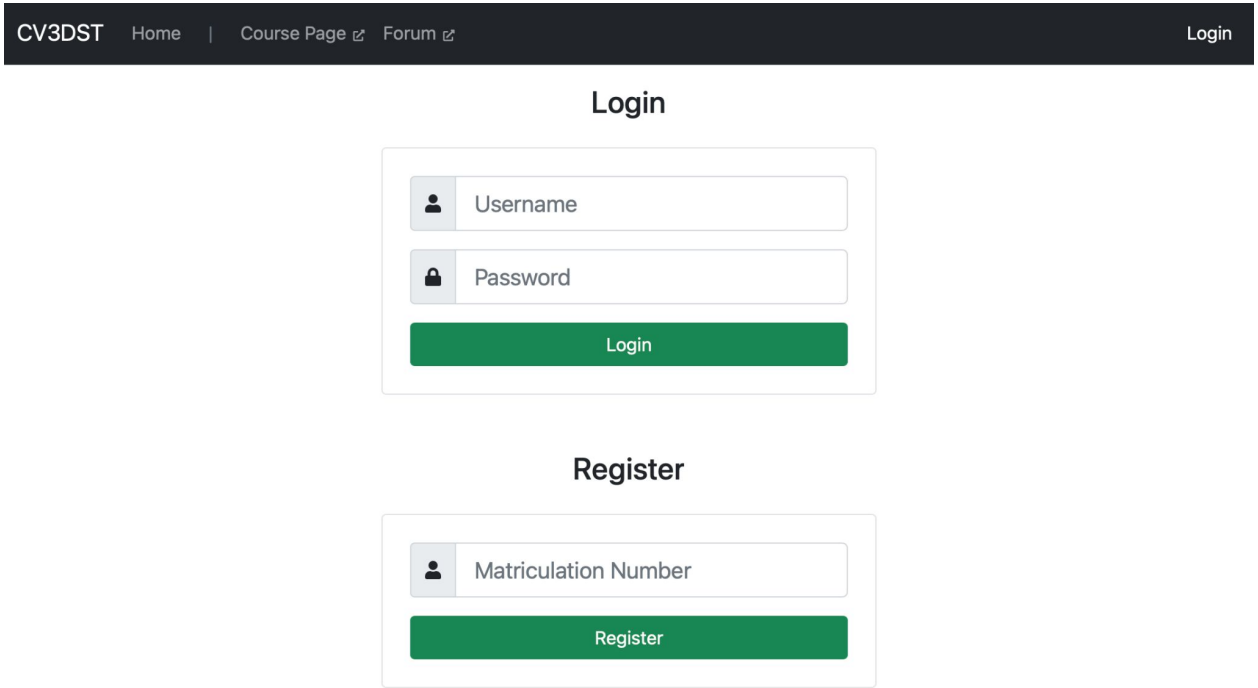
Exercises

- Exercise 3 - ReID with GNNs (30.11):
  - ReID
  - Message Passing Networks
- Exercise 4 - Supervised Segmentation (11.01):
  - Pixel-Adaptive Convolutional Neural Networks:
  - TBD
- Exercise 5 - Unsupervised Segmentation (25.01):
  - Gaussian Mixture Models
  - Spectral Clustering

Exercise 0

- What is PyTorch
  - how does it work?
  - why is it different from numpy
- Datasets and Dataloaders
- A first machine learning project

Exercise 0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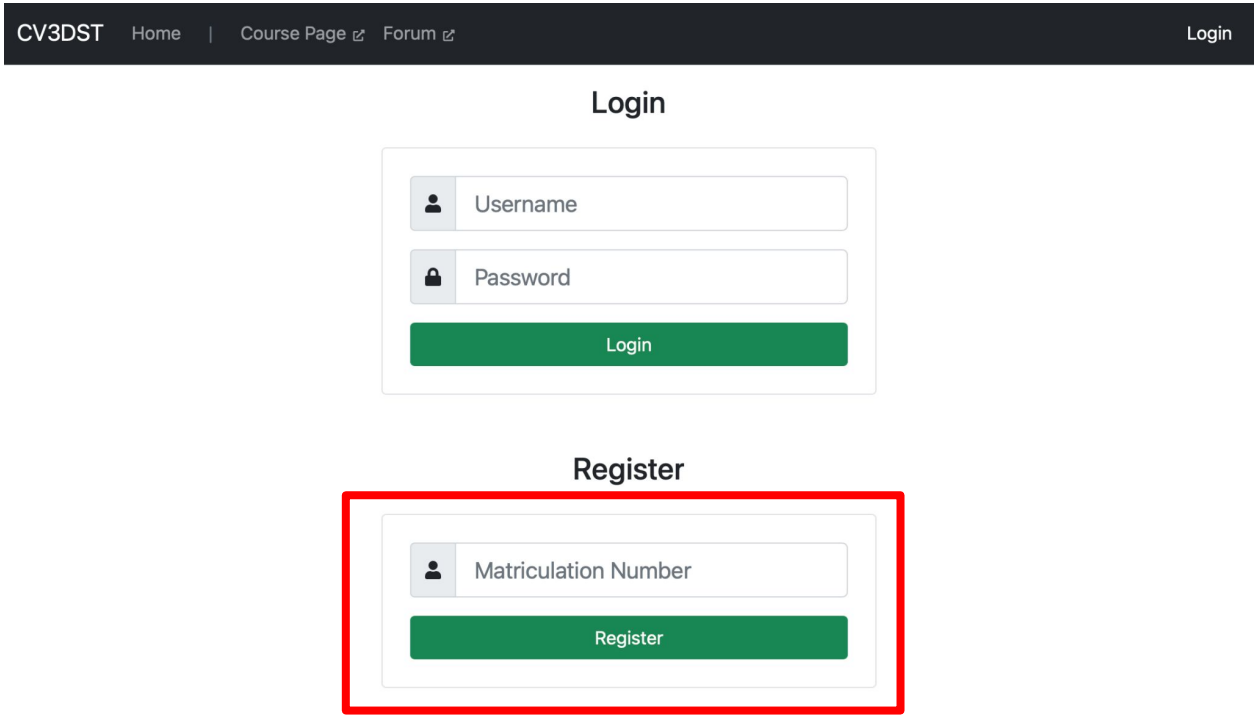
Exercise 0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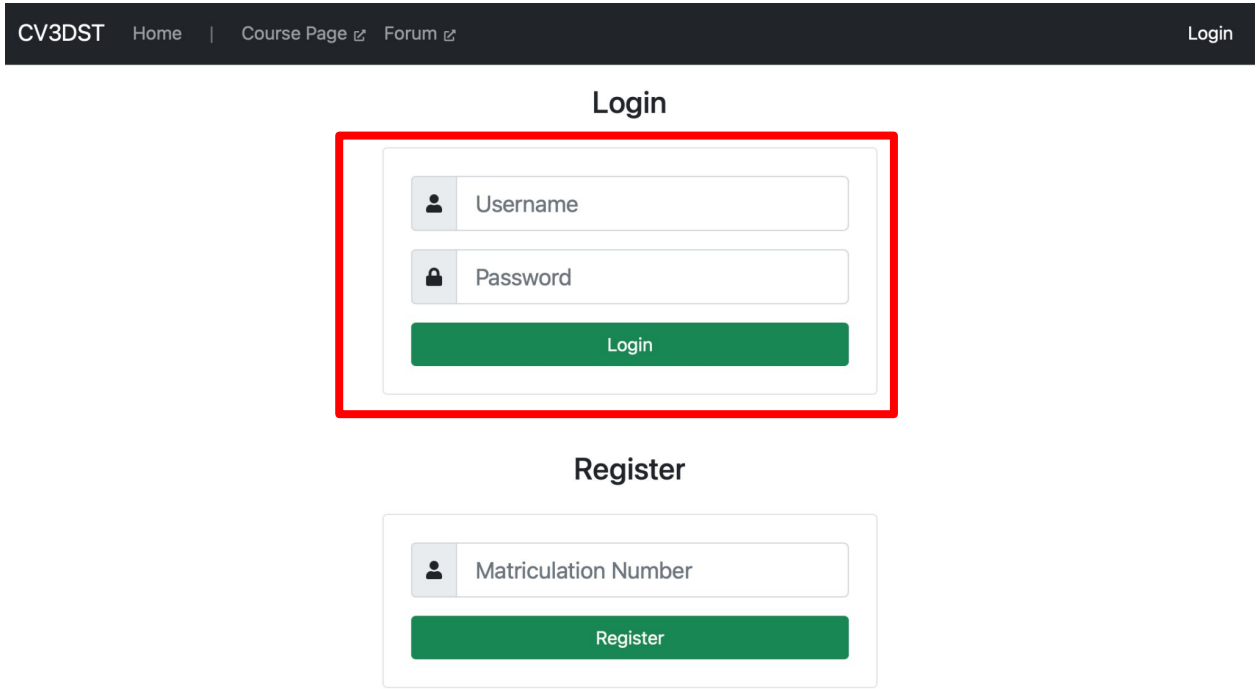
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Links

- Test server: https://cv3dst.cvai.cit.tum.de/login
- If you have trouble registering https://forms.gle/yZkZiDiyHxWuNqQG7
- Basic Folder Structure with Exercise 00: https://vision.in.tum.de/webshare/g/cv3dst/cv3dst.zip
- Datasets: https://vision.in.tum.de/webshare/g/cv3dst/datasets.zip