

# Learning For Self-Driving Cars and Intelligent Systems

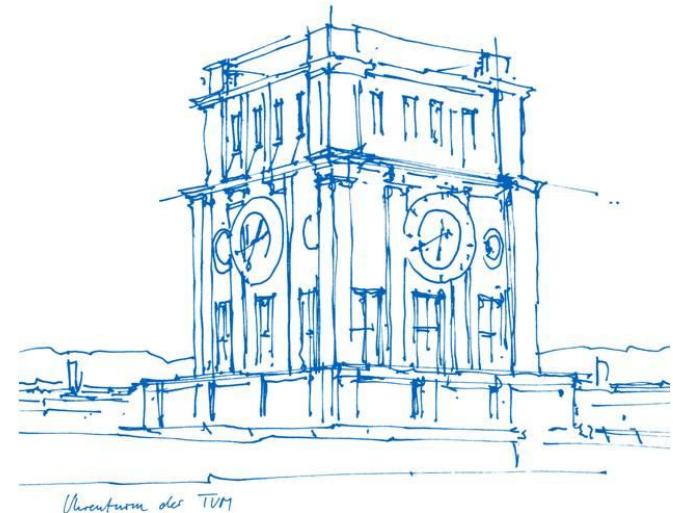
Practical Course

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Summer Semester 2021

Course webpage:

[https://vision.in.tum.de/teaching/ss2021/intellisys\\_ss2021](https://vision.in.tum.de/teaching/ss2021/intellisys_ss2021)



# Introduction

- Masters practical course
- Data modalities: images, GNSS, IMU, point clouds, sets, graphs etc.
- Programming assignments in the initial weeks
- Research oriented projects
- See profile
- max. 2 persons per each group
- Dynamic research goals
- One-on-one meetings with supervisor(s) for updates and resolving issues
- Final Presentations
- Weekly summaries of the work progress
- Mondays, 10-12 pm [Most likely online]
- You will be provided access to the compute resources via ssh for this course.

# Prerequisites

- Proficient in python programming
- Familiar with version control (git)
- Comfortable with DL frameworks: PyTorch, Tensorflow etc.
- Good knowledge of basic mathematics, linear algebra, probability, numerics, analysis etc.
- Participation in at least one of the offered deep learning lectures at TUM

# Application

- Assignment to the course done via the matching system: <https://matching.in.tum.de/>
- Select your preference of the lab course between 9 February to 16 February on the system
- Application documents to be sent separately
- **Send your CV and Transcripts by 16 February 2020 to:** [intellisys-ss21.vision.in@tum.de](mailto:intellisys-ss21.vision.in@tum.de)
- Please see the email format on the next slide
- We can only consider candidates who applied to the matching system **AND** sent their application documents

# Application Email Format

In order to easily evaluate your profile for matching, we ask you to follow the format below:

*Subject: Application [Your Matriculation Number]*

*In the body please give at least the following details:*

- *Matriculation #:*
- *Name:*
- *Name of Degree:*
- *Masters Semester #:*
- *Average Grade:*
  - *Bachelor:*
  - *Master (For the previous semester, if available)*
- *List of Relevant courses taken with grade*

Please remember to also attach your CV and transcripts(Bachelor + Master) with the email.

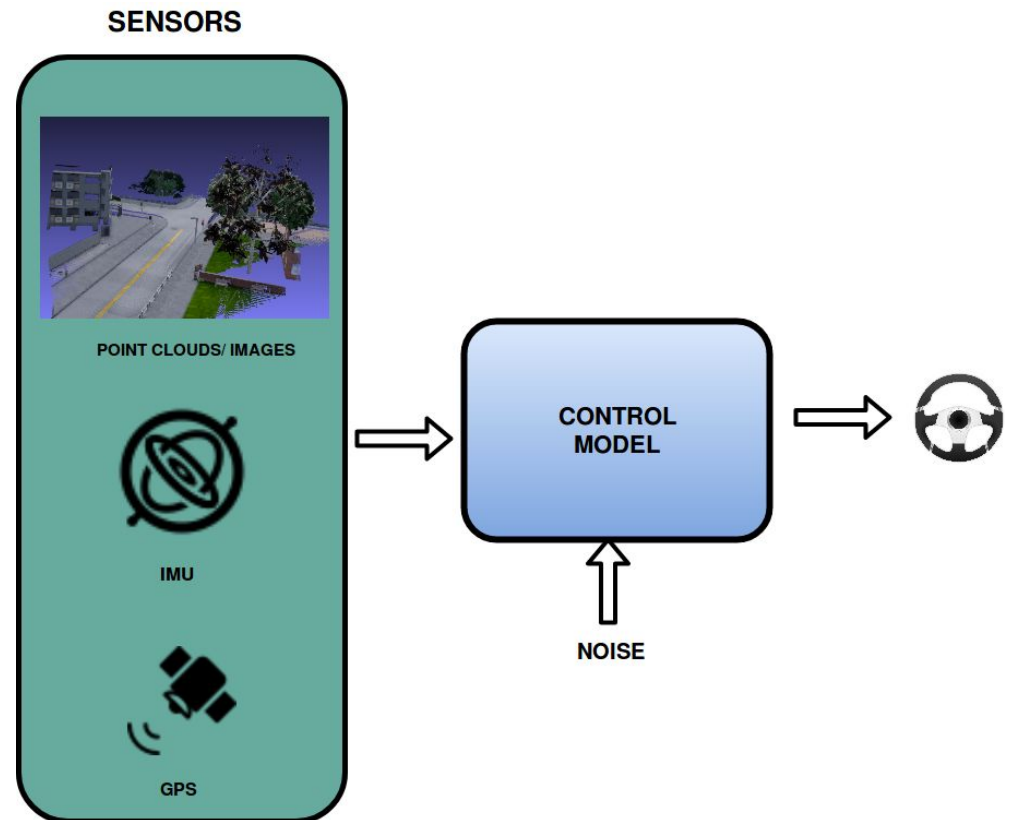
Feel free to share any additional documents, information (for eg. link to git, past research projects) that could support your application. Optional: If you also have a project suggestion matching the theme of the lab course, please briefly describe.

# Projects

- Practical project experience with real-world problems
- Novel application oriented research challenges
- Project Assignment to be done after the initial weeks of programming tasks
- Projects specifics will be decided later
- However, if you have project proposals prior to beginning of the semester. It may be considered
- Nevertheless, some general research areas can be found in the next slides

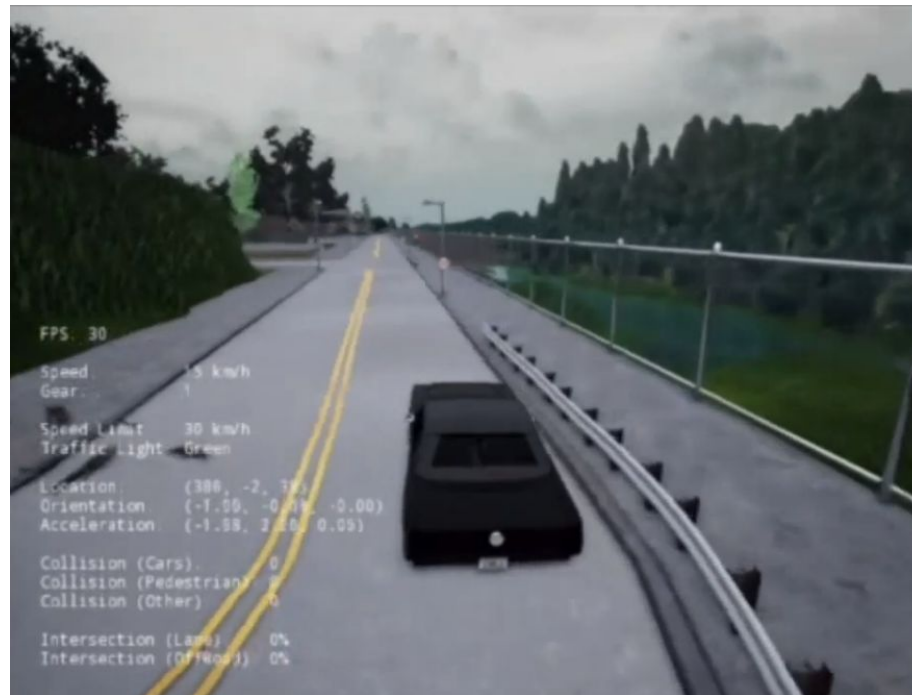
# Projects

- Robot control
  - Embodied agents (Next slide)
  - Robustness to noisy data
  - Multiple Input Modalities



# Projects

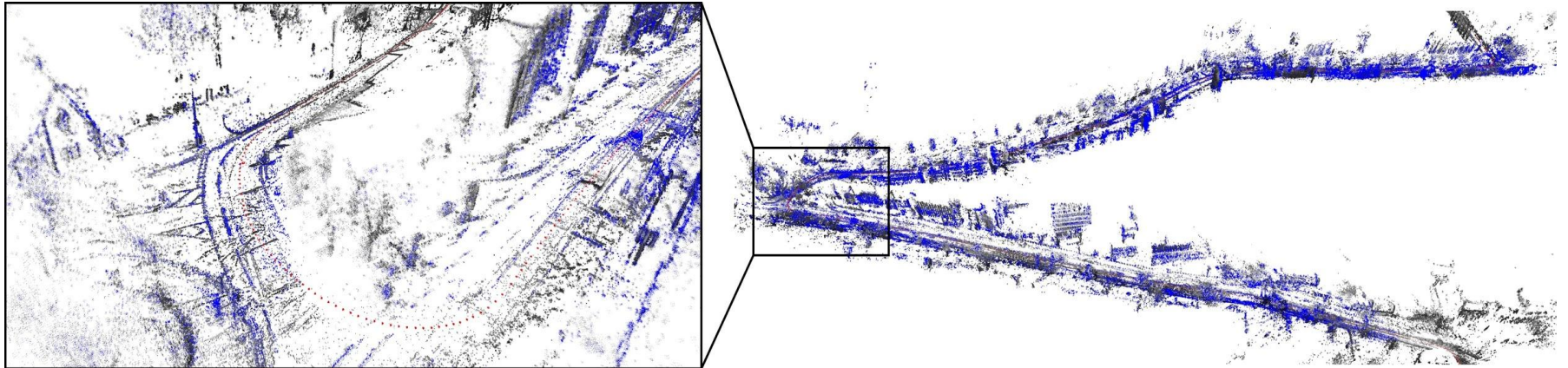
- Testing control algorithms on embodied agents
- Interaction with the environment
- Supervised, self-supervised, reinforcement learning





# Projects

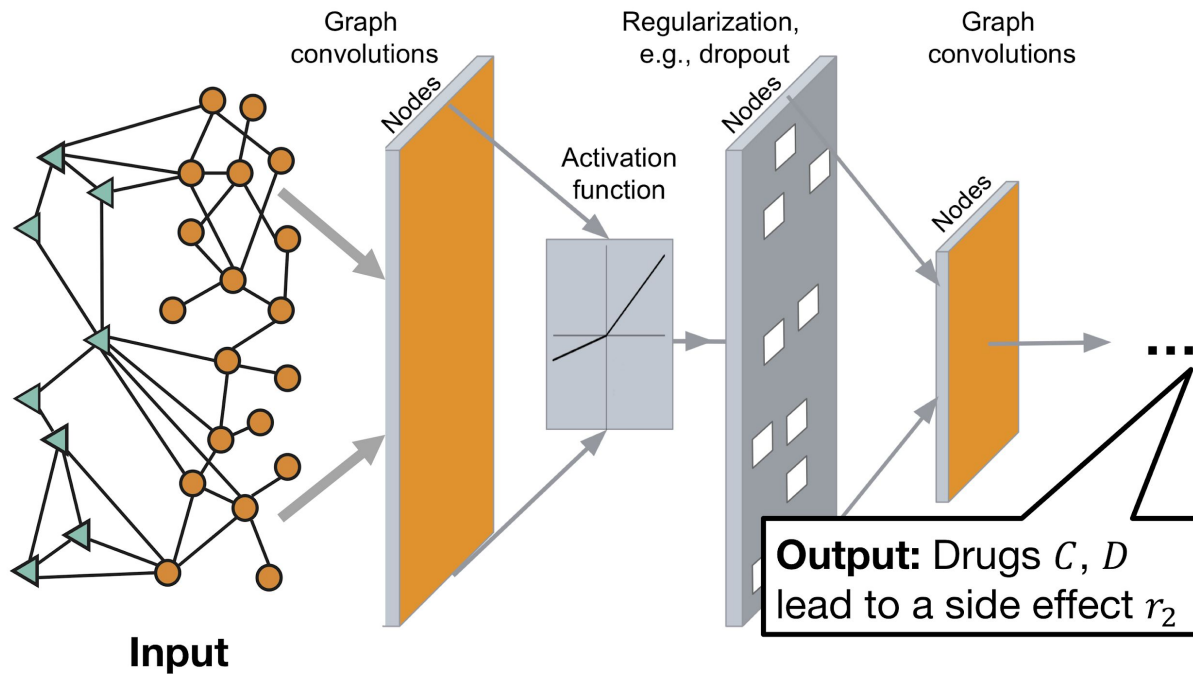
- Perception for self-driving cars
- Environmental understanding
- localization



Reference: <https://arxiv.org/pdf/1904.11932.pdf>  
Accessed on: 05.02.2021

# Projects

- Learning on Graphical Networks,
  - Social Networks, Internet, Molecules /Drug discovery etc.



Reference: <http://snap.stanford.edu/decagon/decagon-overview.png>

Accessed on : 05.02.2021

# QUESTIONS