

# Learning For Self-Driving Cars and Intelligent Systems

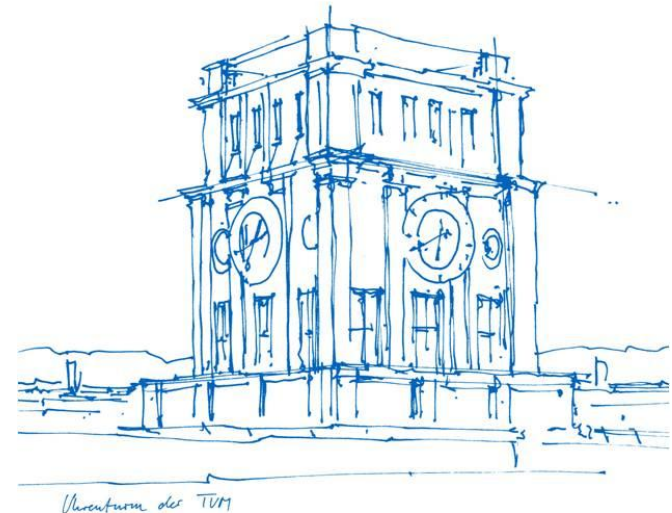
Practical Course

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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

# 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 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 also attach your CV and transcripts(Bachelor and Master) with the email.

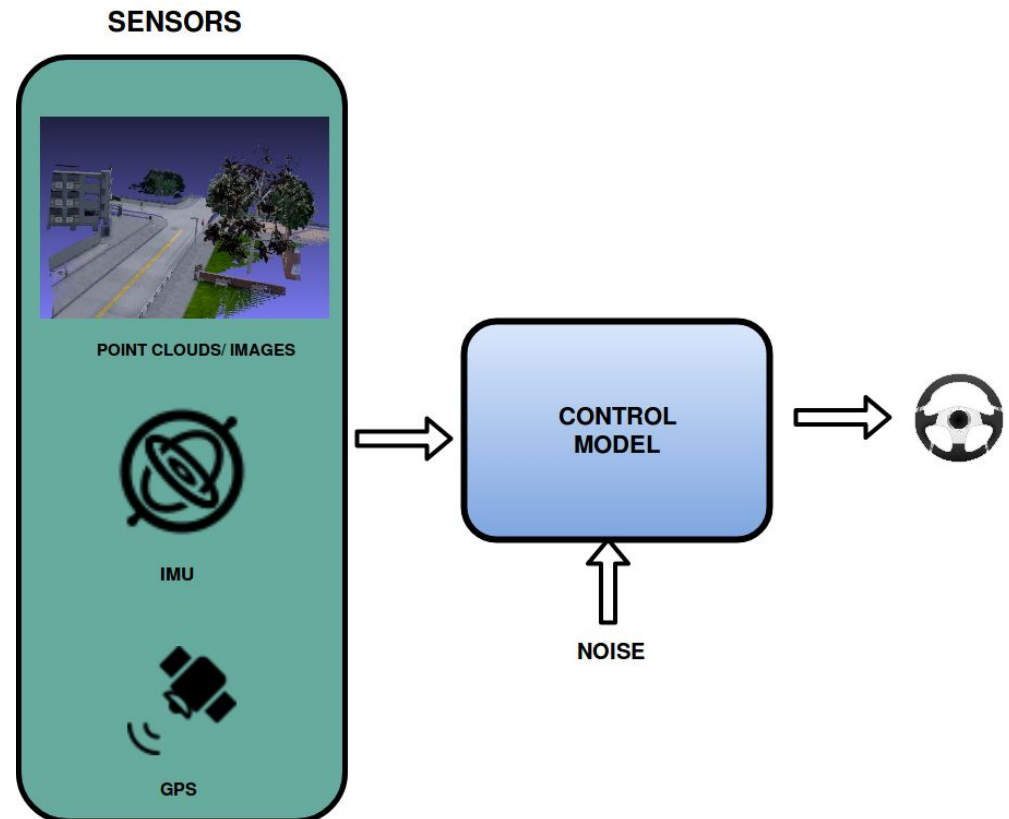
Feel free to share any additional documents, information (for eg. link to git, past research projects) that could support your application. Optional: If you also have a project suggestion matching the theme of the lab course, please briefly describe.

# 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, you can find general research areas in the next slides

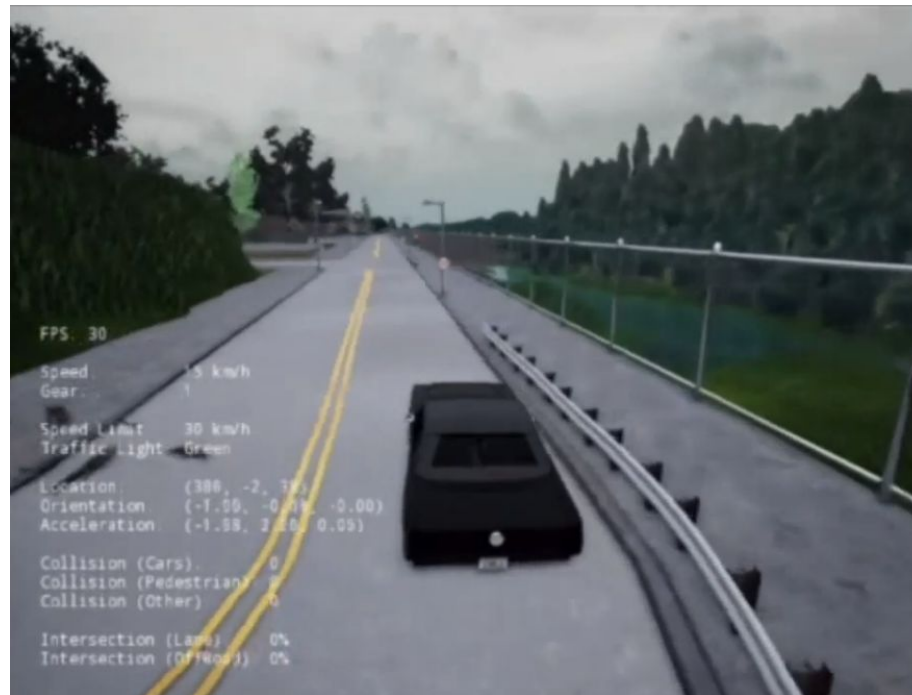
# Projects

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



# Projects

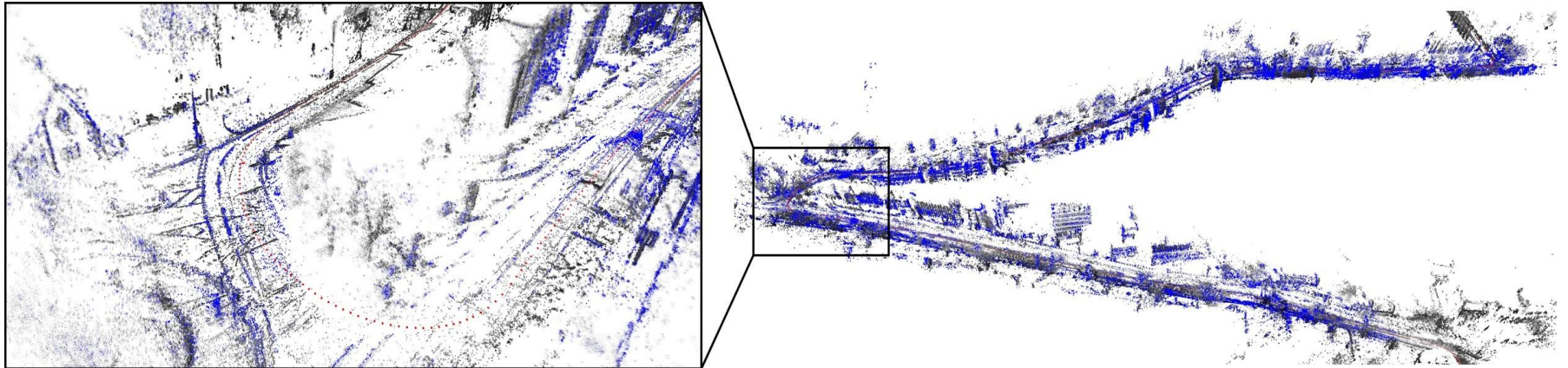
- Testing control algorithms on embodied agents
- Interaction with the environment
- Supervised, self-supervised, reinforcement learning





# Projects

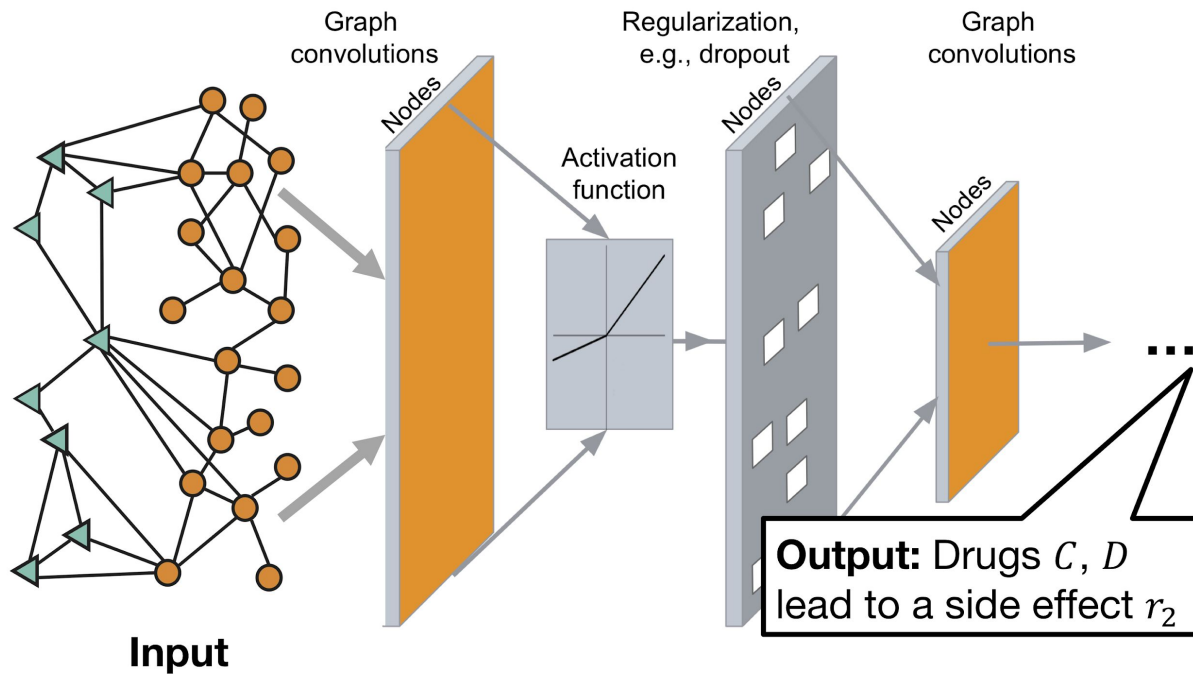
- Perception for self-driving cars
- Environmental understanding
- localization



Reference: <https://arxiv.org/pdf/1904.11932.pdf>  
Accessed on: 05.02.2020

# Projects

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



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

Accessed on : 13.07.2020

# QUESTIONS