

Thesis meeting

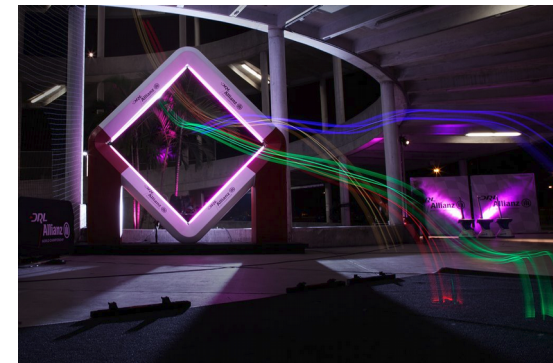
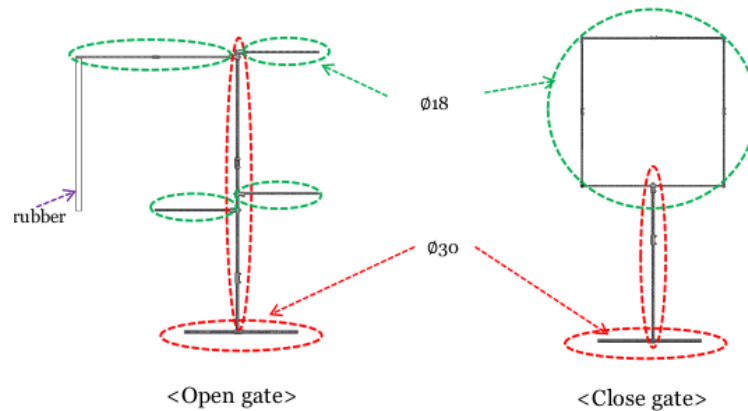
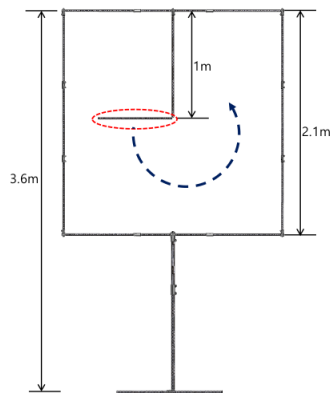
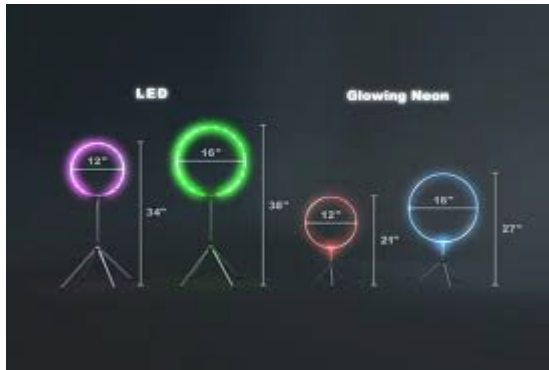
07. November 2017

- General approach
- Dataset generation
- Technical questions
- Road map

Approach

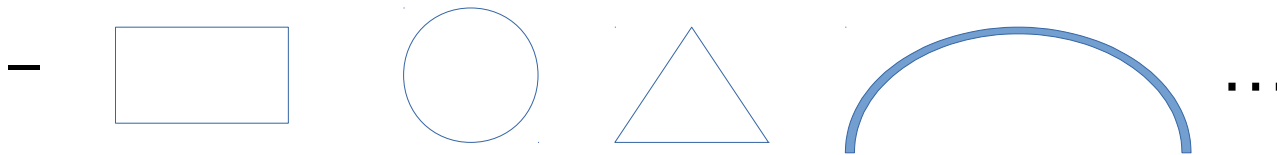
- Navigation based on reference points (is what most other teams are doing)
- We just want to know where we are in relation to the next gate and fly through it
 - Camera Localization problem

Shape examples



Robustness

- Color Invariance
 - Transformation to gray scale/binary image
- Shape Robustness
 - Generate datasets with different shapes:



Possible Methods

- Learn everything from the data
 - Label every picture with relative 6d position
- Recognize gate and do pose estimation based on predefined shapes (PnP)
 - Label gate pixels
- Look for closest hole in direction of next gate
 - Label flyable area/ center of gate
- Pseudo stereo vision using consecutive images

Dataset generation

- Using the simulator
 - Easy and quick
 - Reality gap
- Pasting gate images in real images
 - Difficult for videos/ labeling of absolute position
- Taking videos with another drone and label by hand
 - Most realistic
 - Takes a lot of time
 - Easy to miss a lot of perspectives

Technical Questions

- Whats the simulator software and how can I use it?
- Documents about the drone (Soft- and Hardware)
- Do we have a GPU/ floating point or vector operations?
- Reports from last years algorithms etc
- How does the control work?

Road Map

Date	Milestone
2017 November	Literature review
2017 December	Literature review, first dataset(s)
2018 January	(Official start) Evaluation of different models in python
2018 February	Evaluation of different models in python
2018 March	Implementation on drone
2018 April	Evaluation on drone in real conditions
2018 May	Refinement
2018 June	Refinement
2018 July	Final implementation/ evaluation
2018 August	Report, presentation etc.