

# Drone footage human tracking ~~and face detection~~ (P45)

14. December

# Team (real humans) (still)

- Kert Tali
- Oliver Vainumäe
- Agnes Luhtaru
- Kaspar Valk

Self-proposed  
project



# Problem

- **Idea:** Human detection and drone control from video feed (in real-time)

# Problem

- **Idea:** Human detection and drone control from video feed (in real-time)
- **Project goal**
  - try different ML approaches to do human detection
  - don't just use ready made solutions from packages

# Problem

- **Idea:** Human detection and drone control from video feed (in real-time)
- **Project goal**
  - try different ML approaches to do human detection
  - don't just use ready made solutions from packages
  - **NEW!** make drone self-drive (follow subjects)

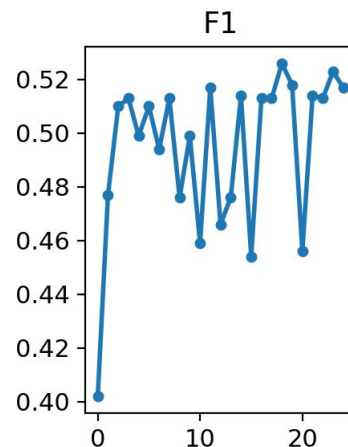
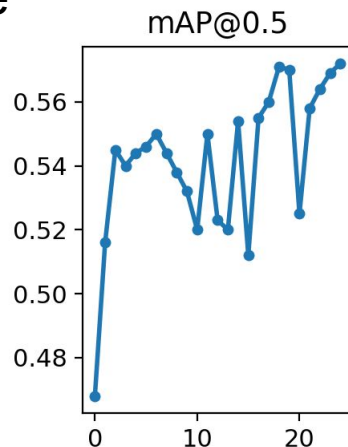
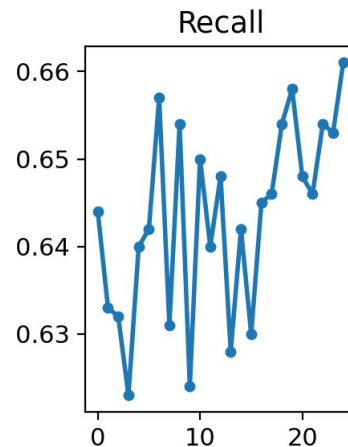
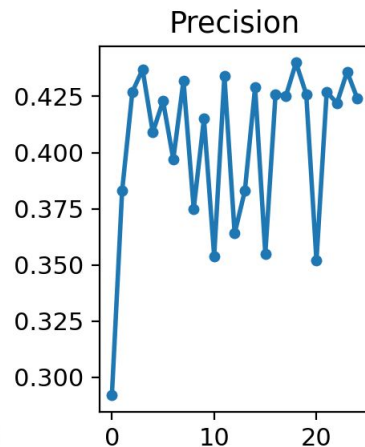
# Problem

- **Idea:** Human detection and drone control from video feed (in real-time)
- **Project goal**
  - try different ML approaches to do human detection
  - don't just use ready made solutions from packages
  - **NEW!** make drone self-drive (follow subjects)
- **Why?** Several use cases
  - mobile surveillance
  - abnormal event detection

# Human detection

## *Darknet YOLOv3* model

- Train on top of pre-trained weights
- HPC rocket cluster
- Whole COCO 2017 dataset images on people
- Transfer learning with frozen layers?
  - didn't use - not performant
- Settled on a smaller model
  - to speed up training and detection



# Drone control

- Tello Edu drone (little and safe)
- Centering the person by turning
- Keeping the same distance
- FPS with tiny YOLO ok, on CPU around 20
- Proportional controller





# Main takeaways

- HPC is a great resource for training models
- Neural networks are HARD but impressive
- Setup is dependency HELL
- Pair programming is GOOD
- Frame rate is IMPORTANT

# Demo

<https://youtu.be/wiRmMsBVlsc>



# Thanks

Project repository:

<https://github.com/TaliKert/drone-video-ml>