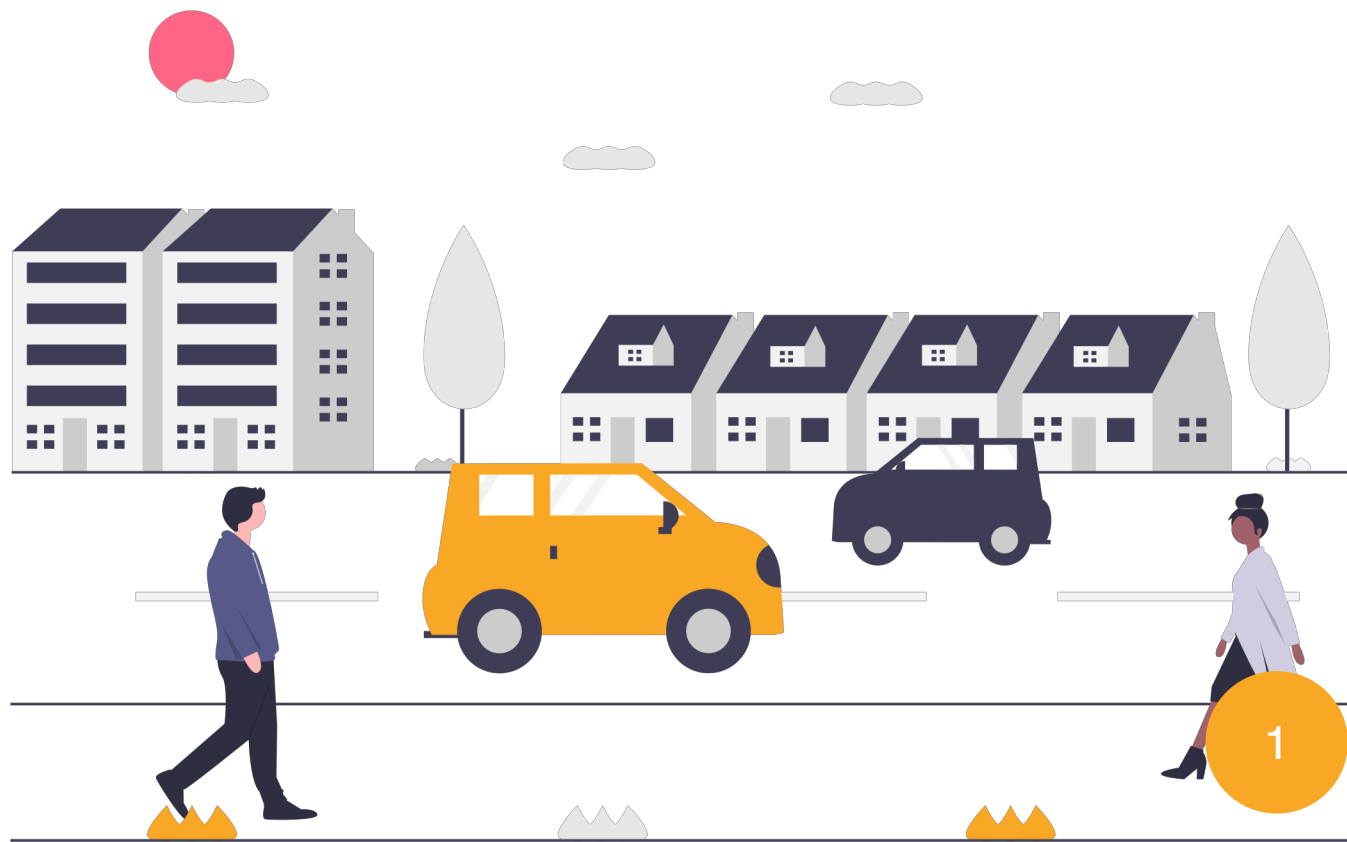


Pokročilé spracovanie obrazu

# Detekcia áut na križovatke

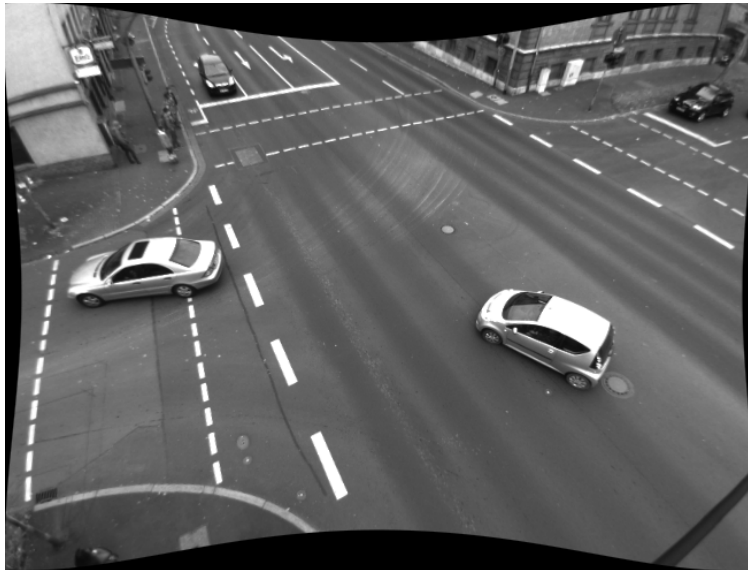
Richard Dominik  
František Tomana

**FMFI UK 2020**



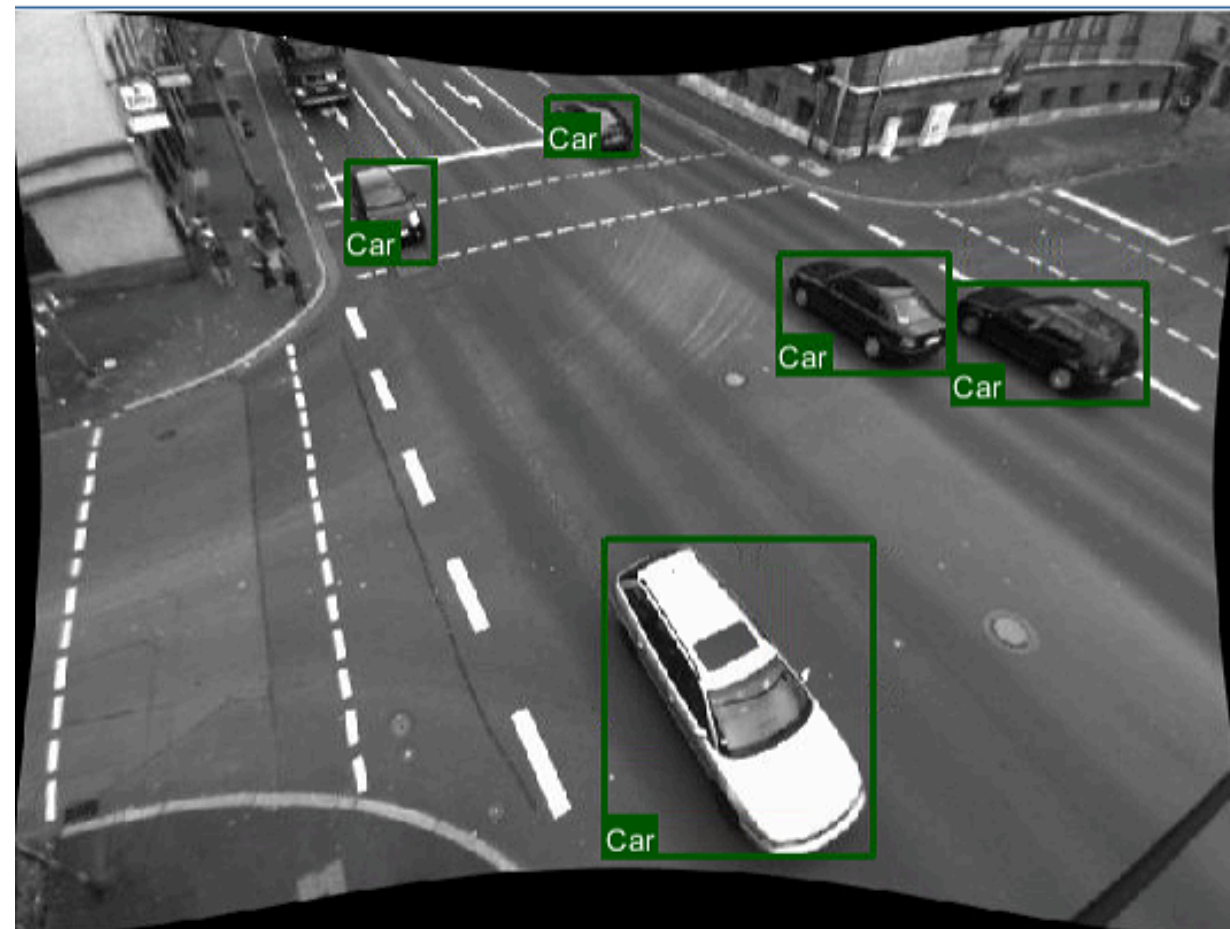
# Dataset

- Github repozitár [traffic-surveillance-dataset](#)
- [2014 - Ko-PER Dataset - Multiple Camera / Multiple Laser](#) všetky sekvencie
- 35 obrázkov bez Ground truth



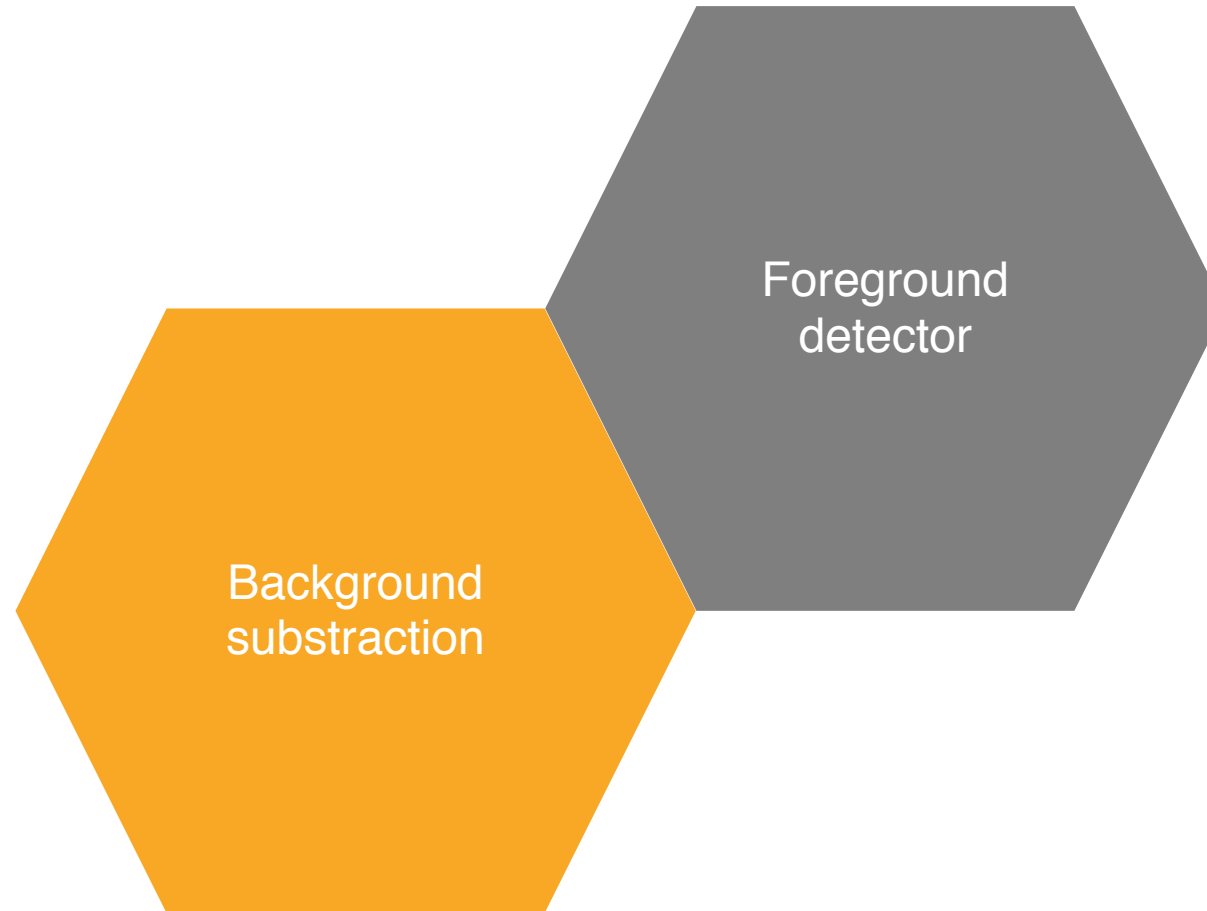
# Ground truth

- pomocou aplikácie Image Labeler
- celý dataset (35 obrázkov)
- .mat súbory s pozíciami bounding boxov





# Metódy



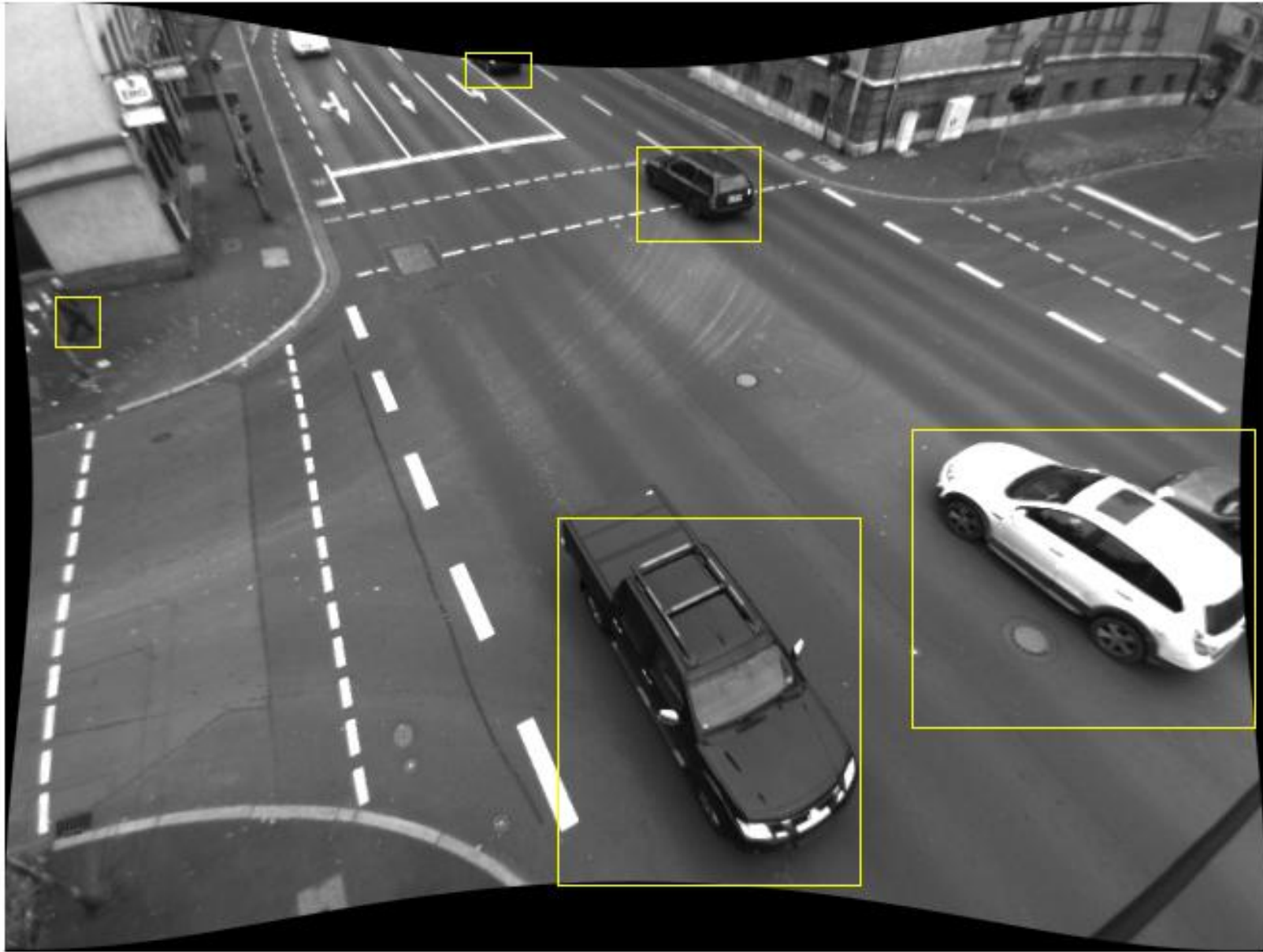
# Foreground detector

- **vyžaduje** viacero obrázkov (prechádzame celý dataset)
- počíta a vracia masku popredia
- gaussovský filter na zníženie šumu
- dilatácia na masku (ŠE štvorec veľkosti 6)
- **vision.BlobAnalysis** pre bounding boxy (**minimalBlobArea 300**)
- počet bounding boxov = počet detegovaných áut

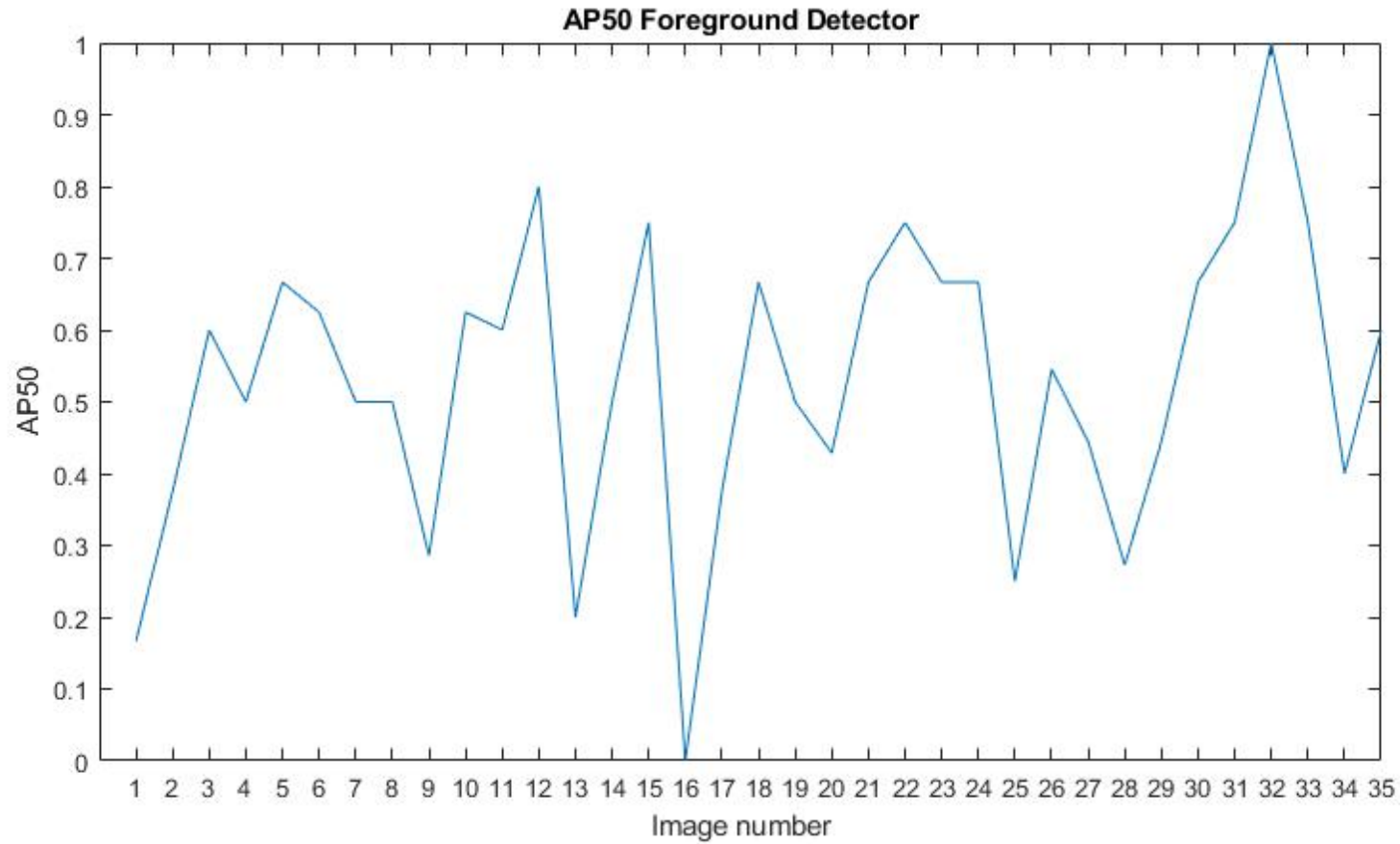






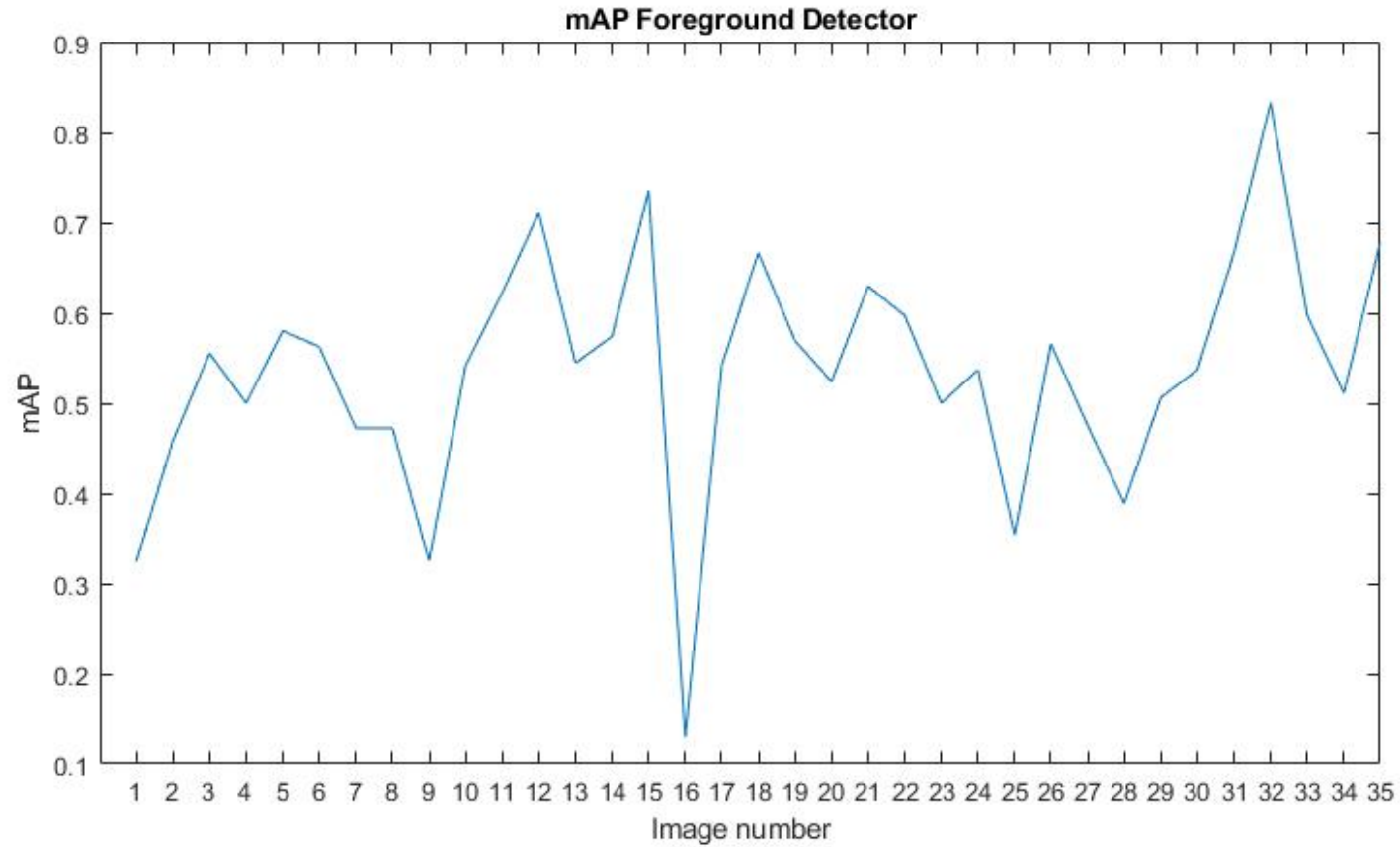


# AP50 metrika



52.96%

# mAP metrika



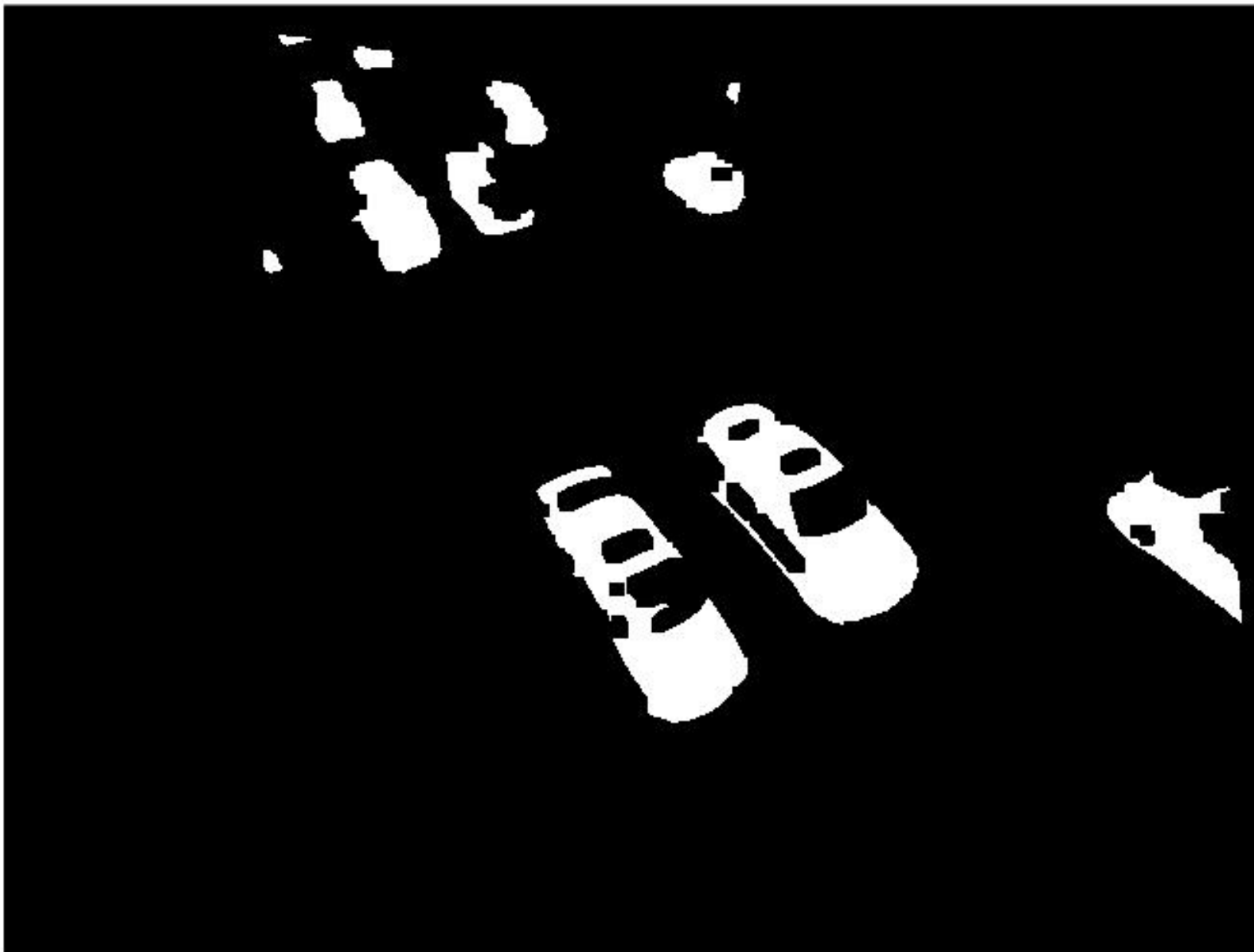
53.68%

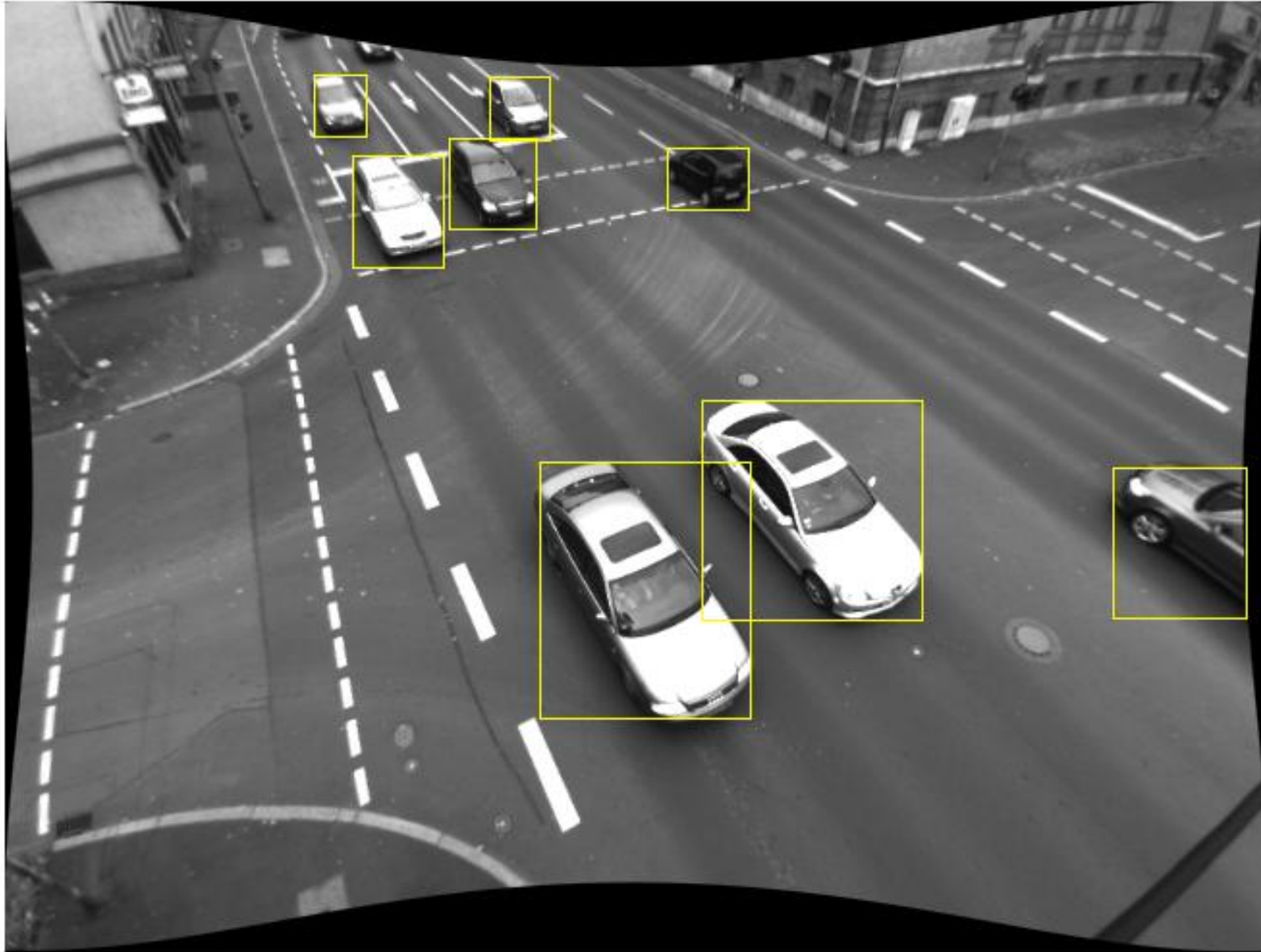
# Background subtraction

- **nevyžaduje** viacero obrázkov
- výpočet pomocou formuly **abs(selectedImage - backgroundImage)**
- prahovanie **> 0.22 = 1**
- **bwareaopen** (odstálenie malých objektov)
- **zatvorenie** (ŠE štvorec veľkosti 7)
- **vision.BlobAnalysis** pre bounding boxy (**minimalBlobArea 300**)
- počet bounding boxov = počet detegovaných áut



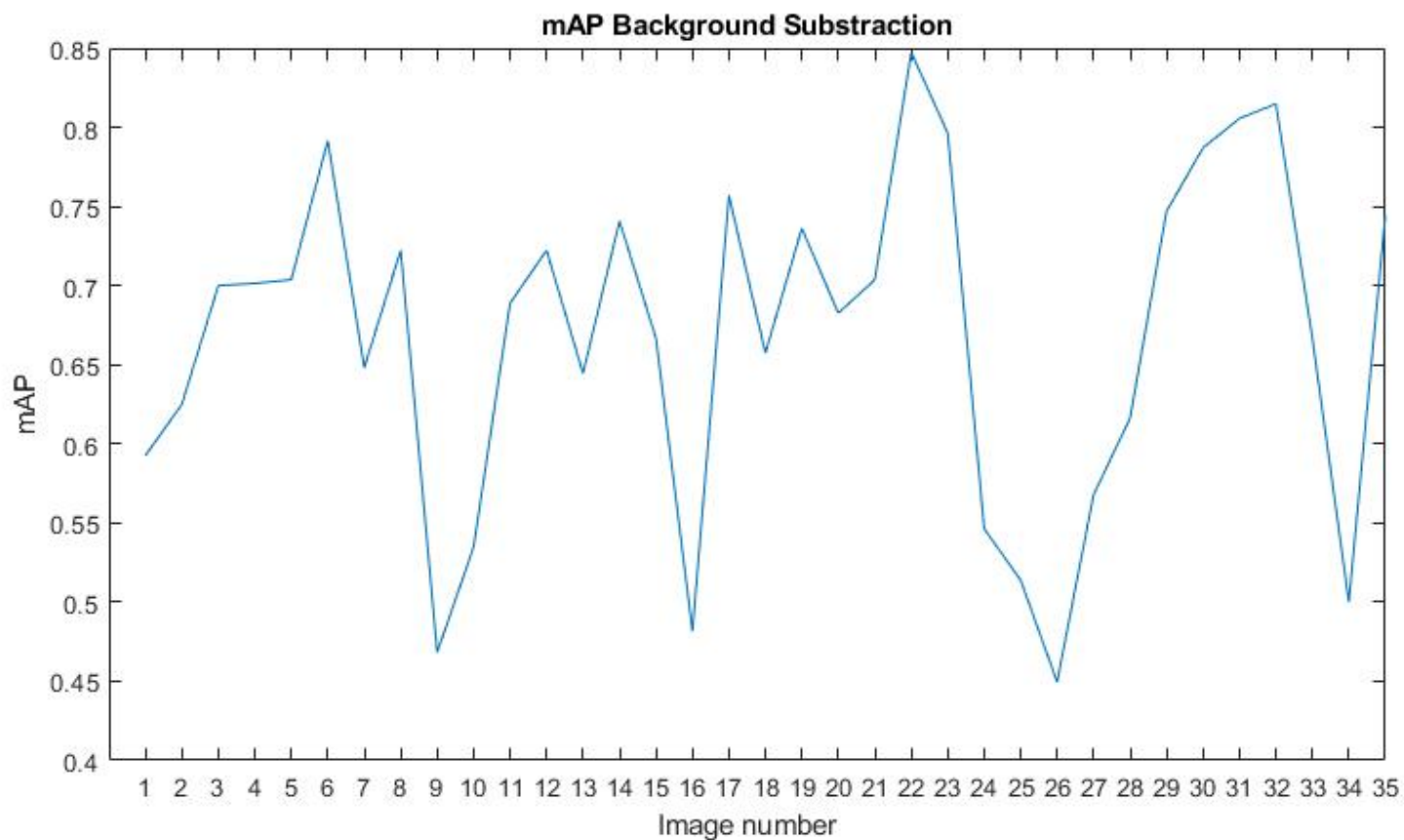






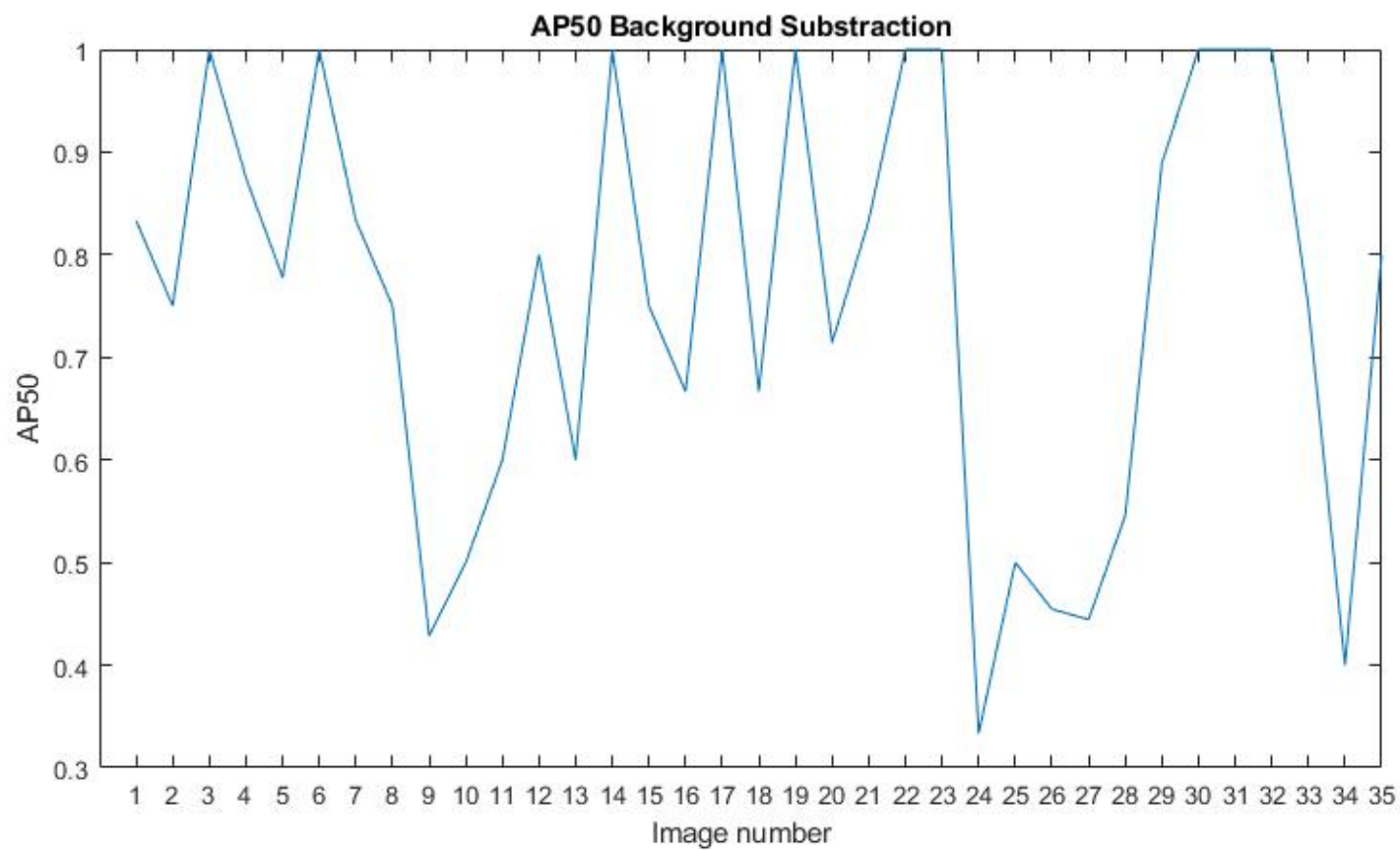


# AP50 metrika



75.70%

# mAP metrika



66.77%

# Vyhodnotenie

Foreground detector

Background subtraction

AP50

**52.96%**

**<**

**75.70%**

mAP

**53.68%**

**<**

**66.77%**

# Demo

# Zdroje

- [https://github.com/gustavovelascoh/traffic-surveillance-dataset?fbclid=IwAR1pZr6aXNYu5MXb\\_Wl3Y4ptkdCFwhg-uIBH1tHX65T9AMA8XAc5sv53PRY](https://github.com/gustavovelascoh/traffic-surveillance-dataset?fbclid=IwAR1pZr6aXNYu5MXb_Wl3Y4ptkdCFwhg-uIBH1tHX65T9AMA8XAc5sv53PRY)
- <https://www.uni-ulm.de/in/mrm/forschung/datensaetze.html?fbclid=IwAR3gY8NY4f3P7u1hX6vrp9un8ONTQWRbwIXA1zJi1ykP6I7QMfqlv0pgEr8>
- [https://www.inf.ed.ac.uk/teaching/courses/av/DEMOS/AVTutorial\\_3.pdf](https://www.inf.ed.ac.uk/teaching/courses/av/DEMOS/AVTutorial_3.pdf)
- <https://www.mathworks.com/help/vision/ref/vision.foregrounddetector-system-object.html>

Ďakujeme za pozornosť !?



# Q&A