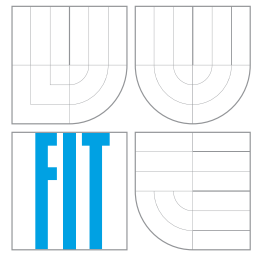# Traffic Analysis From Video

Jakub Sochor   supervised by: doc. Ing. Adam Herout, PhD.

We propose a complex and **fully automated** system for **traffic analysis**. It is possible to count vehicles, classify them, detect lanes and **accurately measure speed** of vehicles and it requires **no manual calibration**.
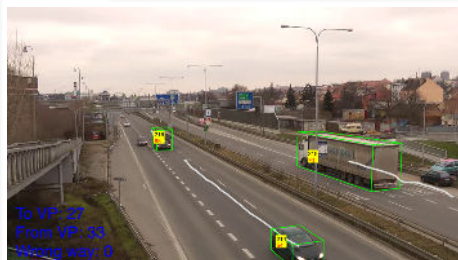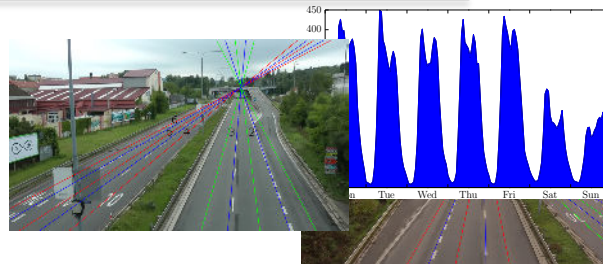
Proposed Solution

- ❑ Fully automatic camera calibration
- ❑ Runs in real time
- ❑ Published in top journal and conference
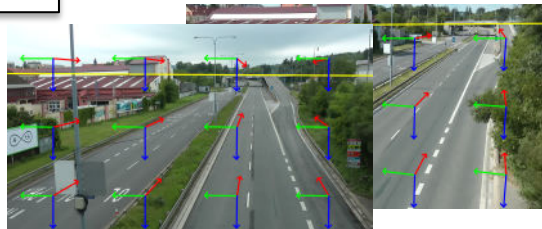
- ❑ 3D bounding boxes are constructed
- ❑ Enable to measure dimensions of vehicles
- ❑ Scale is calibrated by statistics of dimensions

- ❑ Accurately detects lanes
- ❑ Estimate direction of vehicles
- ❑ Generate overall statistics

- ❑ Final system monitoring a road
- ❑ Red numbers denote speed of vehicles
- ❑ Deployed for real traffic surveillance

Results

- ❑ Detect and track vehicles – accuracy: **0.915**
- ❑ Precise speed measurement – mean error: **4.5%**
- ❑ Classification of vehicles with accuracy: **96.1%**
- ❑ Precise lanes detection
- ❑ Fully automated – no manual input required
- ❑ Runs in real time – **70 FPS**

3rd **best paper** award **winner** of EEICT

Publications Based on This Work

- ❑ **SOCHOR Jakub**. **Fully Automated Real-Time Vehicles Detection and Tracking with Lanes Analysis**. In Proceedings of CESCG 2014. TU Vienna.
- ❑ **SOCHOR Jakub**. **Fully automated real-time traffic analysis from video**. In Proceedings of the 20th Conference STUDENT EEICT 2014, vol. 2, Brno University of Technology, pp. 54–56.
- ❑ DUBSKÁ Markéta, **SOCHOR Jakub** and HEROUT Adam. **Automatic Camera Calibration for Traffic Understanding**. In: Proceedings of British Machine Vision Conference 2014, Nottingham
- ❑ DUBSKÁ Markéta, HEROUT Adam, JURÁNEK Roman and **SOCHOR Jakub**. **Fully Automatic Roadside Camera Calibration for Traffic Surveillance**. IEEE Transactions on Intelligent Transportation Systems. 2014 (IF: 2,47)