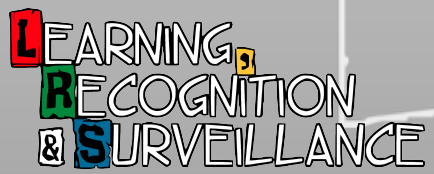
An Intent-Based Automated Traffic Light for Pedestrians

H. Possegger

29 Nov 2018



2 Illustrations

[www.icg.tugraz.at]

LEARNING, RECOGNITION & SURVEILLANCE

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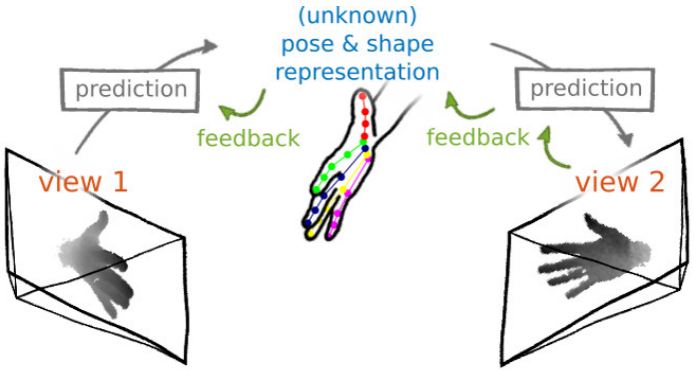
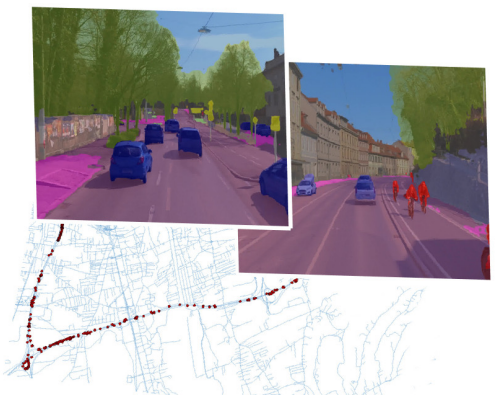


Two viewpoints [Poier'18]

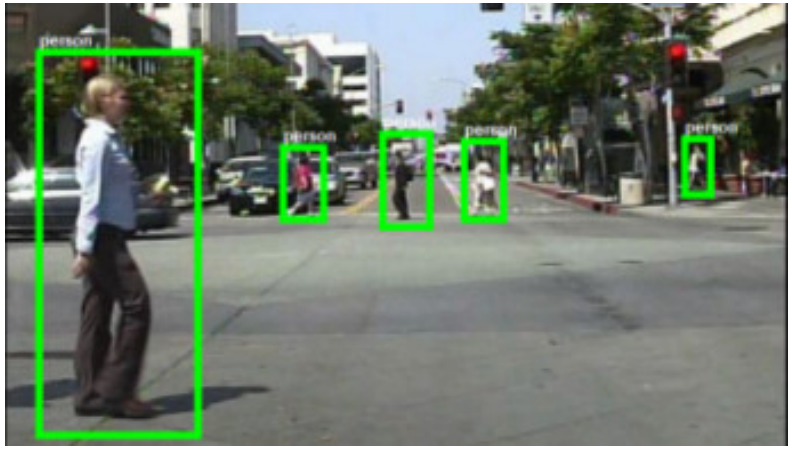


Segmentation results

[Poier'18] Poier, *et al. Learning Pose Specific Representations by Predicting Different Views.* CVPR'18.

3 An Efficient Multi-Object Detection & Tracking Framework

- Accuracy/runtime trade-off:
  - Single Shot MultiBox detector [3]
  - Backbone: compressed AlexNet [2,5]
  - Optimized implementation with **AVX2 instructions**
- Tracking-by-detection
  - Model pretrained on Caltech [1]
  - Extended Kalman filters
  - Robust matching via geometric cues & closed-world assumptions [4]



Caltech Pedestrian Dataset [1]

[1] Dollár, *et al. Pedestrian Detection: An Evaluation of the State of the Art.* TPAMI 34(4), 2012

[2] Krizhevsky *et al. ImageNet Classification with Deep Conv. Neural Networks.* NIPS'12

[3] Liu, *et al. SSD: Single Shot MultiBox Detector.* ECCV'16

[4] Possegger, *et al. Occlusion Geodesics for Online Multi-Object Tracking.* CVPR'14

[5] Romero, *et al. FitNets: Hints for Thin Deep Nets.* ICLR'15

4 Data Preprocessing

- Robustly detect approaching pedestrians
- Temporally link detections into trajectories
- Remove outliers, reduce jitter

Douglas & Peucker. *Algorithms for the Reduction of the Number of Points Required to Represent a Digitized Line or Its Caricature.* Cartographica 10(2):112–122, 1973.

How to prepare a bad slide?

Don't do this!

- Mix different fonts and sizes
- Don't check fr typogrphicl mistakes
- Use punctuation inconsistently.
- Forget the slide number so noone can refer to this slide
- Put all the text you're going to say on the slide – surely, your audience loves to read along with you
- Save the references for the last slide, so nobody knows which papers you're currently talking about
- Mix different citation styles (*e.g.* [1] and [VWA'19])
- Don't typeset equations, but include low-quality screenshots instead:

$$\int_0^\infty e^{-\alpha x^2}\,\mathrm{d}x = \frac{1}{2}\sqrt{\int_{-\infty}^{\infty} e^{-\alpha x^2}\,\mathrm{d}x \int_{-\infty}^{\infty} e^{-\alpha y^2}\,\mathrm{d}y} = \frac{1}{2}\sqrt{\frac{\pi}{\alpha}}.$$

A list of all my references

Don't do this!

- Don't forget to **be inconsistent** (with respect to conference/journal naming, reference style, etc.)
- Use tiny/small font sizes so you can fit all references in this list

[1] Cavanagh & Alvarez. *Tracking Multiple Targets with Multifocal Attention.* TICS 9(7), 2005

[2] Dollár, *et al. Pedestrian Detection: An Evaluation of the State of the Art.* TPAMI 34(4), 2012

[3] Liu, *et al. SSD: Single Shot MultiBox Detector.* ECCV'16

[4] Krizhevsky *et al. ImageNet Classification with Deep Conv. Neural Networks.* NIPS'12

[Poier'18] Poier, *et al. Learning Pose Specific Representations by Predicting Different Views.* CVPR'18.

[5] Possegger, *et al. Occlusion Geodesics for Online Multi-Object Tracking.* IEEE Conference on Computer Vision and Pattern Recognition (instead of the acronym **CVPR** as for the other references), 2014 (instead of the abbreviated **'14** as for other conference papers).

[6] Romero, *et al. FitNets: Hints for Thin Deep Nets.* ICLR'15

[7] Rudelsdorfer *et al. A novel Method for the Analysis of Sequential Actions in Team Handball.* IJCSS 13(1), 2014

[8] Sternig *et al. Multi-camera Multi-object Tracking by Robust Hough-based Homography Projections.* ICCVW VS'11