Master in Computer Vision Barcelona

Project Module 4 Coordination

Video Surveillance for Road Traffic Monitoring

Week 5: Tasks Description
Academic Year 2015/2016

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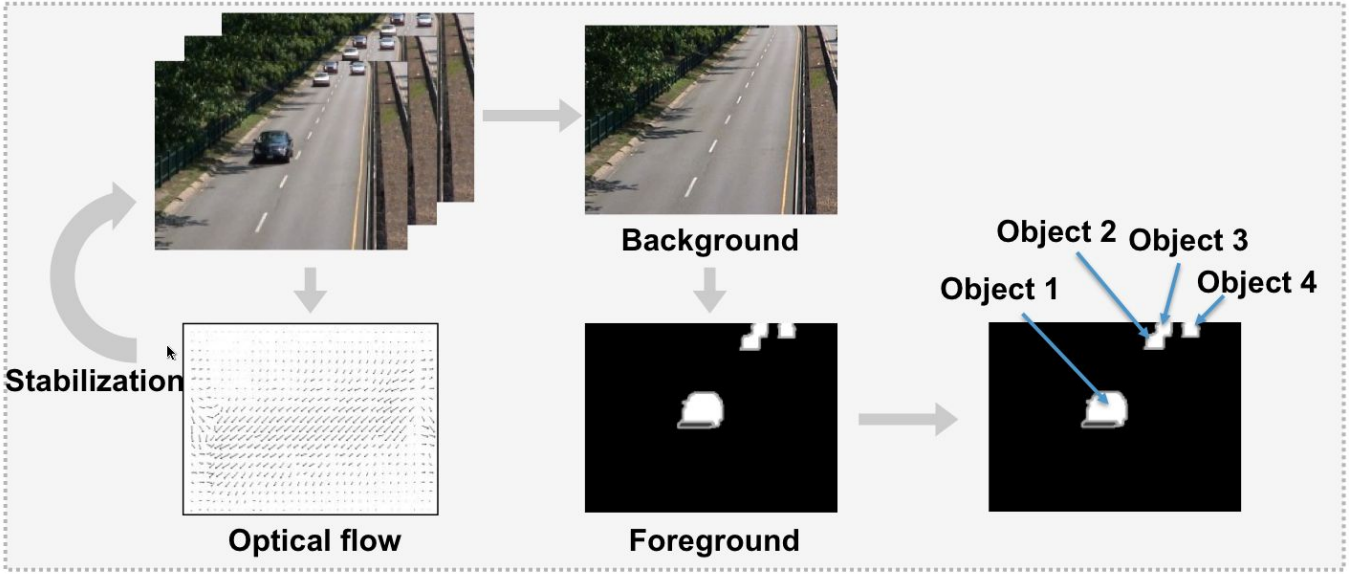
Master in Computer Vision Barcelona

UAB UOC UPC upf.

Project Schedule



Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
•Introduction •DB •Evaluation metrics	•Background estimation •Stauffer & Grimson	•Foreground segmentation •Area filter •Hole filling •Shadow removal	•Optical flow •Video stabilization	•Region tracking •Kalman filter	•**Presentation**

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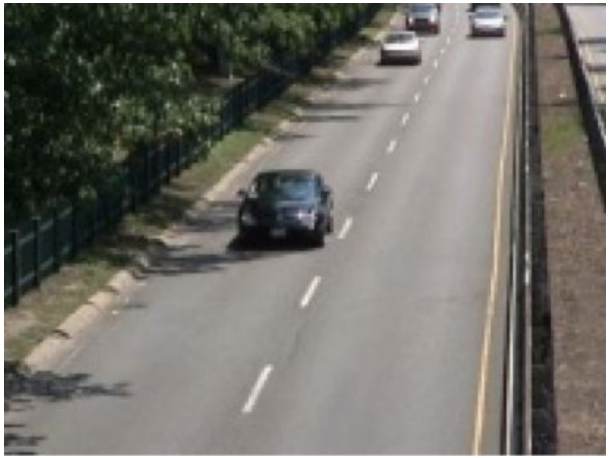
Goals for the Week 5

- Count the amount of vehicles on a road.
- Estimate the speed of vehicles using visual cues.

Sequences

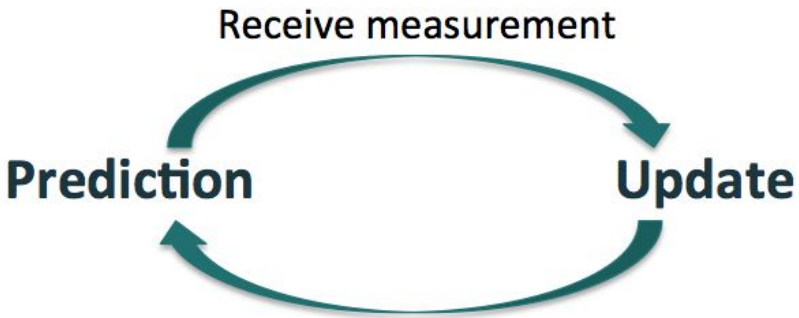
- HIGHWAY:
  - Development: 1050-1350
  - Demo: Rest



- TRAFFIC
  - Development: 950-1050
  - Demo: Rest

Task 1: Vehicle tracker

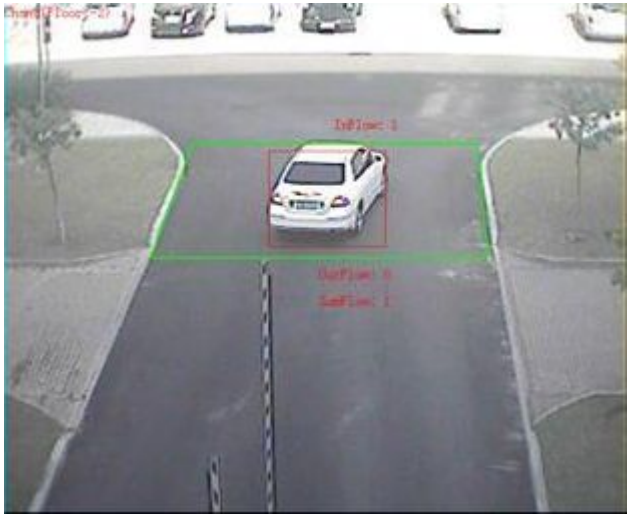
- Use Kalman filter to track each vehicle appearing in the sequence.
- Apply the background substraction work previously done.



Slide credit: Kristen Grauman

Task 2: Vehicle counter

- Draw a bounding box around each vehicle with an ID counter.



Task 3: Speed estimation

- Estimate the speed of the vehicles.
- Specify any **assumption** you make to simplify the problem (KISS).

HIGHWAY

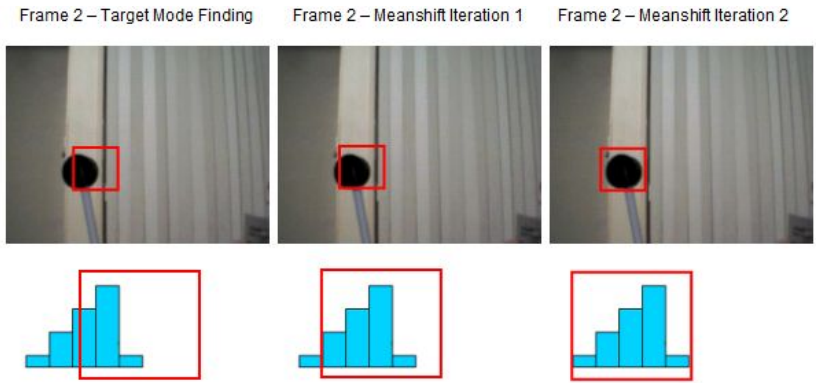
	Estimated speed
Vehicle 1	
Vehicle 2	
...	
Vehicle M	

TRAFFIC

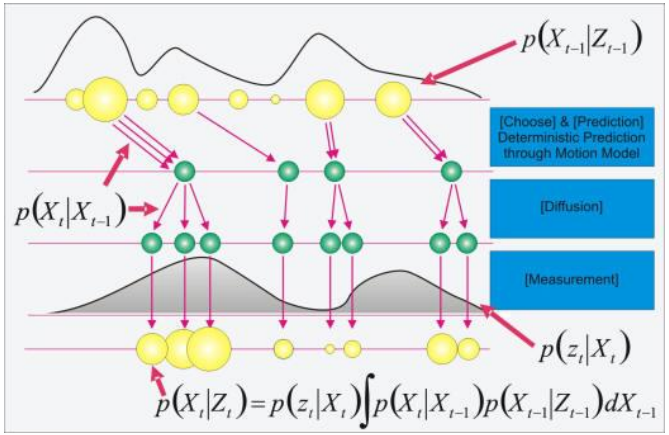
	Estimated speed
Vehicle 1	
Vehicle 2	
...	
Vehicle N	

Task 4 (optional): Other tracking methods

- Test another tracking method:
  - Mean-shift
  - Particle filter
  - Deep learning techniques [Wang 2013]
  - ...many more ideas on the Visual Tracker benchmark.



Source: Arif Khan

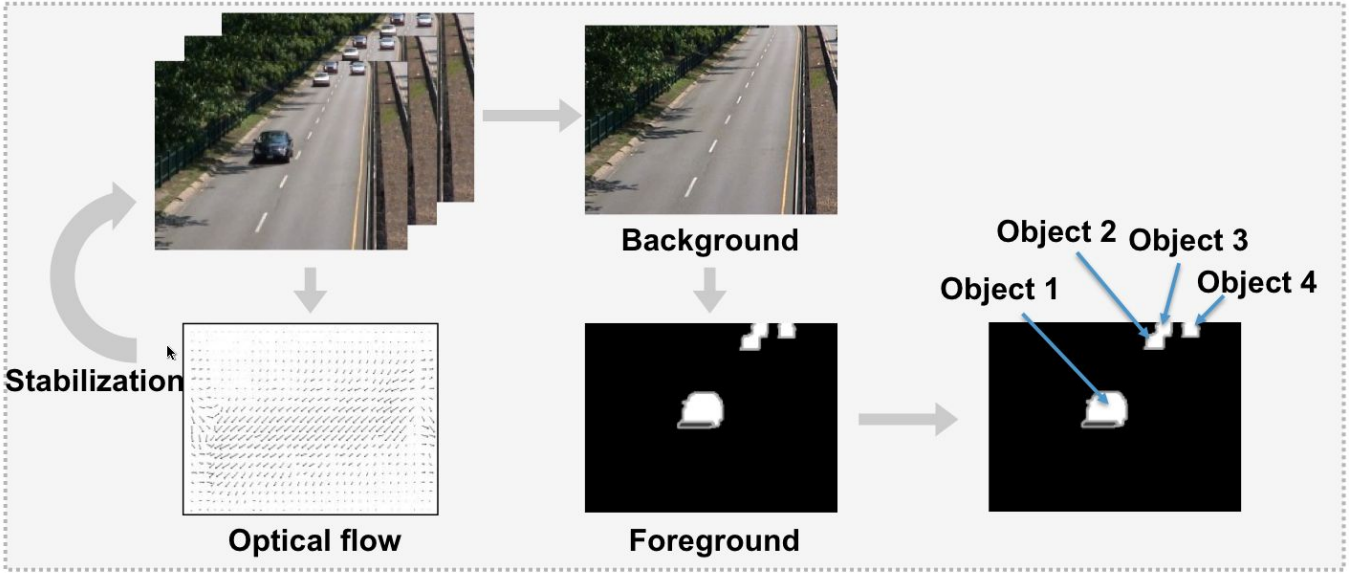


Source: Sven Fleck, Florian Busch, Wolfgang Strasser

Task 5 (optional): Process your own sequence

- Record a video sequence with traffic monitoring.
  - Viewpoint
  - Road geometry
  - Static and/or handheld
- (optional) Generate a simple speed ground truth with in-vehicle recording of the speed meter.

Project Schedule



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Final presentation

- 3rd Workshop on “Road Traffic Monitoring”.
- Report on ALL tasks (also the past ones).

Paper submission

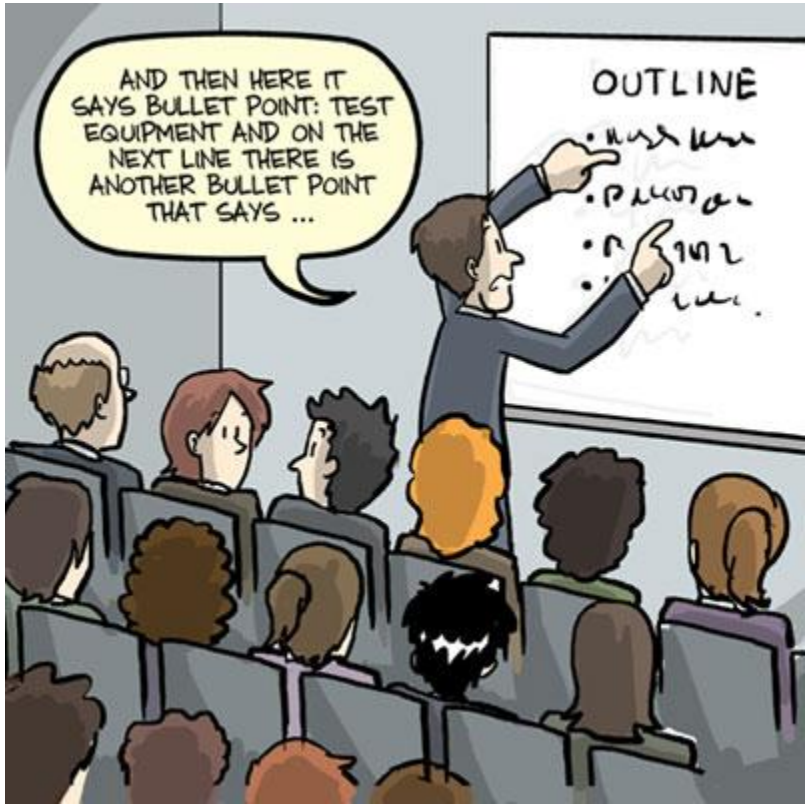
- Submit your 4-pages paper following the ICIP 2016 format guidelines.
- Use online collaborarive Latex editors (eg. overleaf, sharelatex, authorea…)
- Release your paper in Creative Commons license to be published and distributed online.
- Explain the complete system with:
  - Motivation
  - Related work
  - Your system
  - Evaluation
  - Conclusions
  - References.

Project page

- Use GitHub webpage generator (or your own system) to publicly describe your work.
- Link to your paper and slides.
- Optionally, link your professional profile for job junting (eg. LinkedIn).

Oral presentation guidelines

- Oral presentation of 12 minutes



Oral presentation guidelines

DO's	DO NOT's
Look at the audience	Look at the screen or computer.
Speak aloud and clear (probably slowly)	Mumble or hurry up.
Adapt your speech to the audience	Pretend your audience are people who hear about the topic for the the first time.
Use your slides to illustrate your speech.	Consider your slides are working notes to read.
Number your pages.	
Help assessment by including the team ID and name of the speaker at the footer.	
Make it very accessible: slideshare.net (+LinkedIn), GDrive, PDF...	Deliver a Microsoft PPT or Apple Keynote.

Deliverables

What	How	When
Source Code	GitHub repository	Friday 29th January 2016 ay 9pm
Project page	Build with GitHub pages Link on an issue from deliverables repo	Friday 29th January 2016 at 9pm
Paper	paper.pdf at GitHub repository root Linked from the project page.	Friday 29th January 2016 at 9pm
Coevaluation	Online form linked from deliverable repo	Thursday 4th February 2016 at 3pm
Slides	Link from the project page.	Thursday 4th February 2016 at 3pm