IN-DEPTH UNDERSTANDING OF ACCIDENT CAUSATION FOR VULNERABLE ROAD USERS

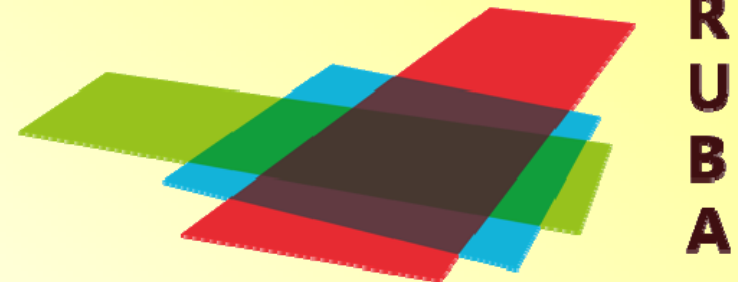# RUBA - video analysis software for road user behaviour analyses

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Structure of presentation

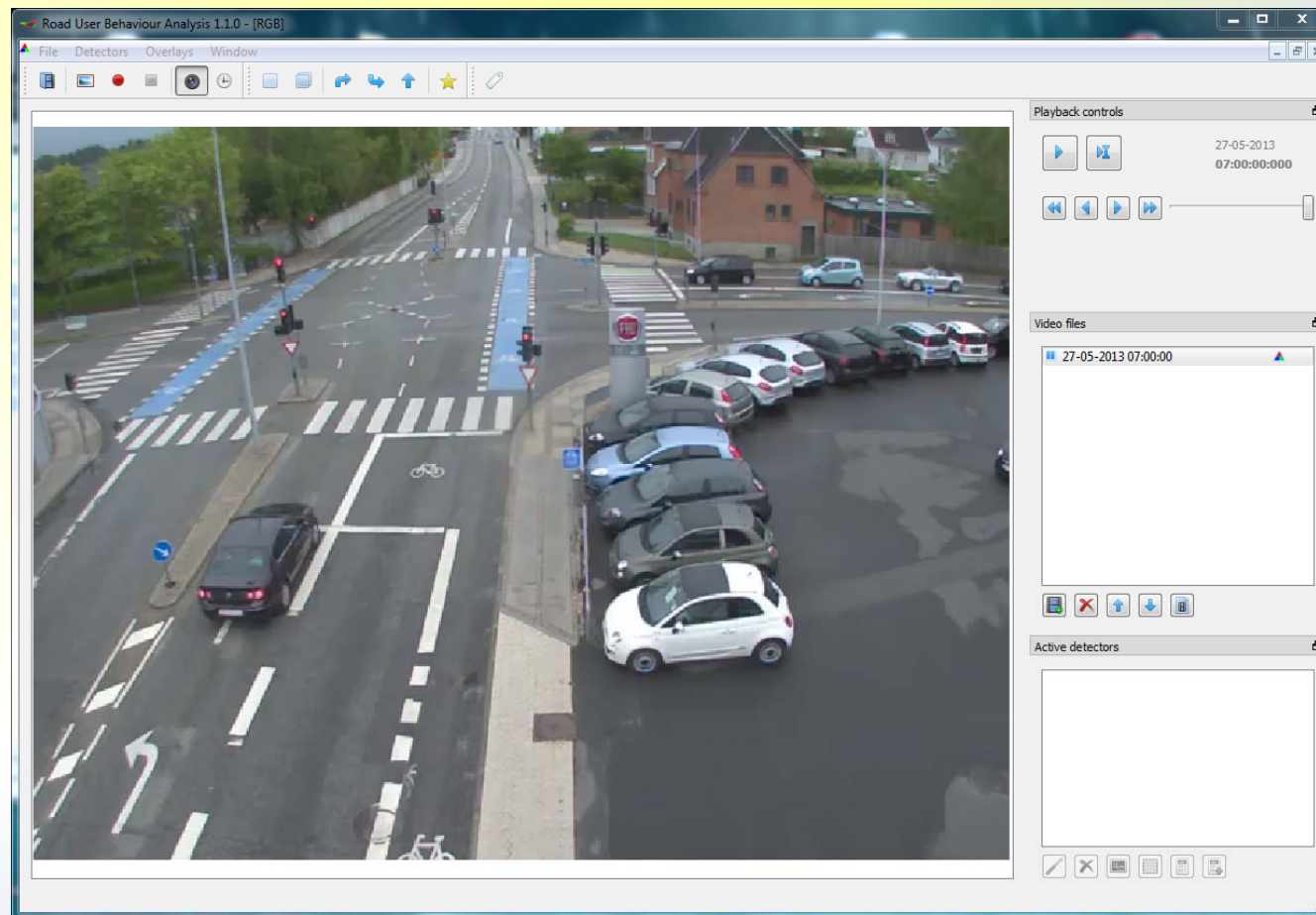- Introduction to RUBA
- Examples of applications
- (example in RUBA)

Purpose of RUBA

Watchdog function

RUBA interface

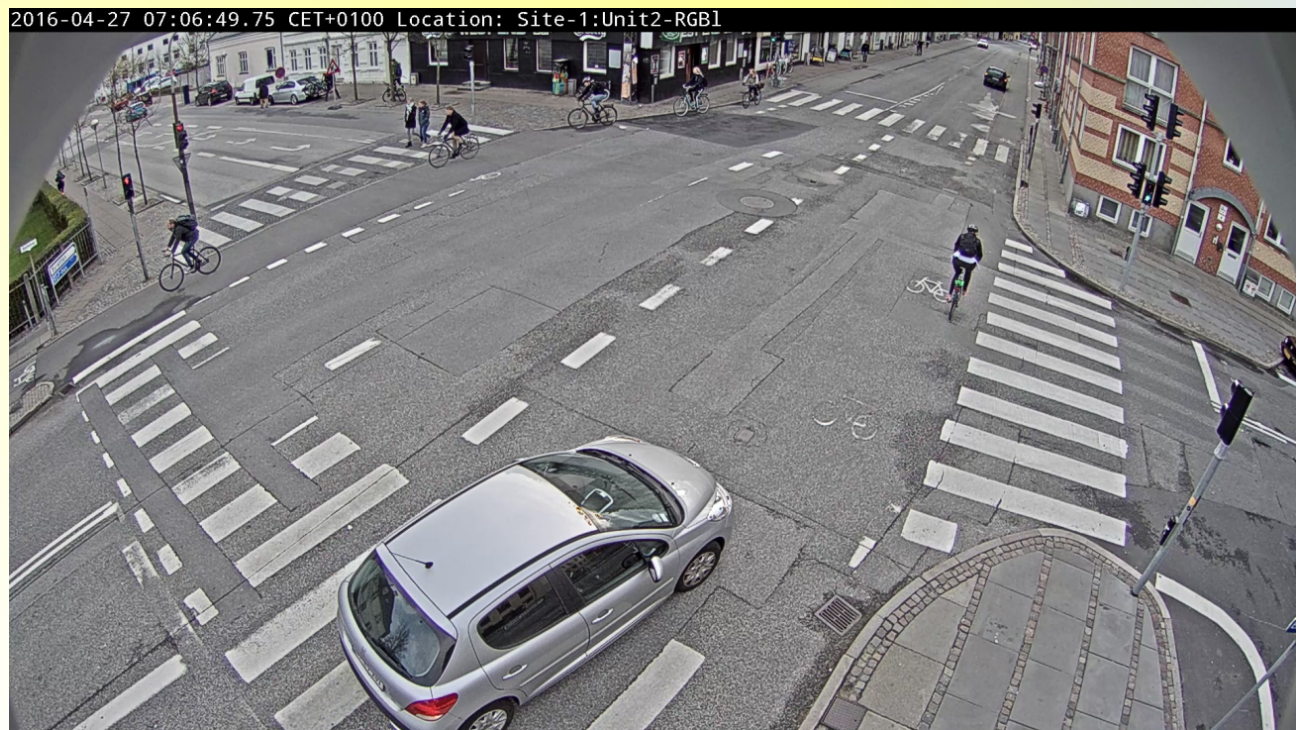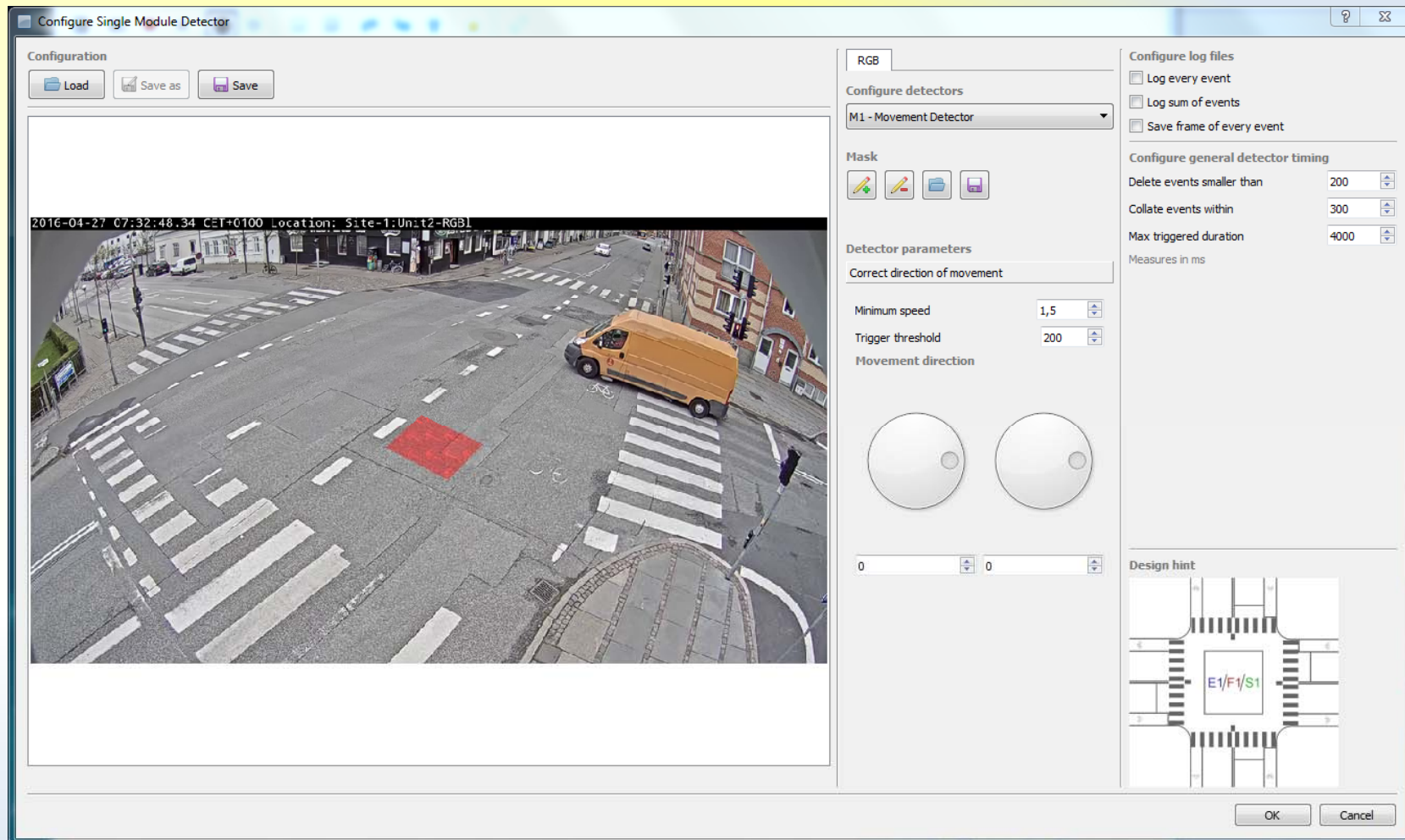# How it works

- Registration of activity/motion
- Analysis of video frame by frame

2016-04-27 07:06:49.75 CET+0100 Location: Site-1:Unit2-RGB1

How it works

Calibration
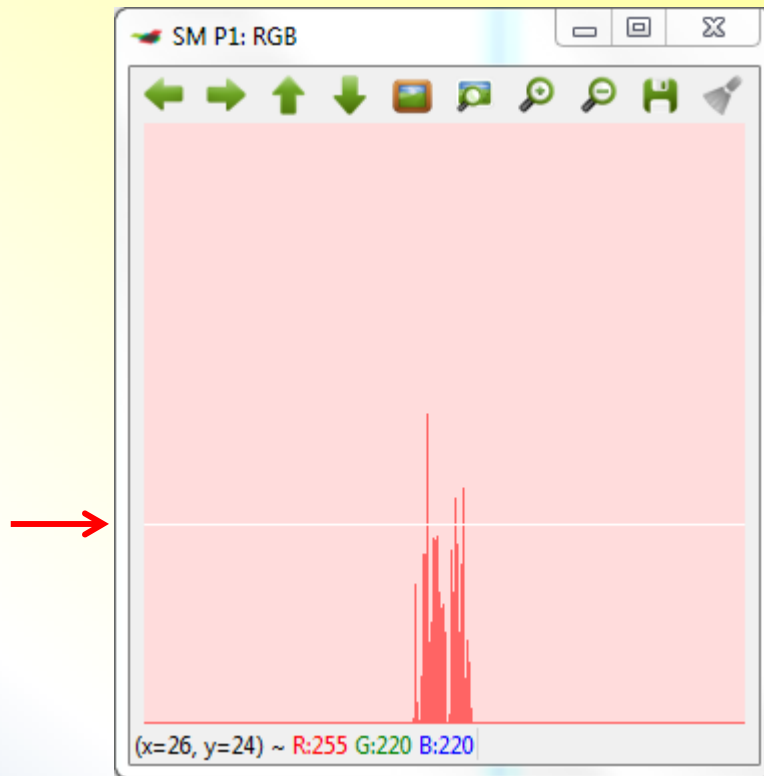
Detector types

Output

Timestamp of each road user

	A	B	C	D	E
1	File	Date	Entering	Leaving	Duration
2	20160427_070249_DE99	27-04-2016	07:03:47.000	07:03:47.500	500
3	20160427_070249_DE99	27-04-2016	07:04:22.766	07:04:24.100	1334
4	20160427_070249_DE99	27-04-2016	07:05:10.066	07:05:11.033	967
5	20160427_070249_DE99	27-04-2016	07:05:11.733	07:05:12.566	833
6	20160427_070249_DE99	27-04-2016	07:05:15.200	07:05:17.233	2033
7	20160427_070249_DE99	27-04-2016	07:05:20.133	07:05:21.066	933
8	20160427_070249_DE99	27-04-2016	07:05:57.766	07:05:59.133	1367
9	20160427_070249_DE99	27-04-2016	07:05:59.733	07:06:00.200	467
10					

Screenshot of each road user

Number of road users in xx minutes

	A	B	C	D	E
1	File	Date	TimeStart	TimeEnd	Objects
2	20160427_070249_DE99	27-04-2016	07:03:00.000	07:04:00.000	1
3	20160427_070249_DE99	27-04-2016	07:04:00.000	07:05:00.000	1
4	20160427_070249_DE99	27-04-2016	07:05:00.000	07:06:00.000	5
5					

What can RUBA be used for?

Traffic conflict studies

– Detecting potential conflicts

Behavioural studies

– Wrong-way driving

– Pedestrians crossing the road

– …

Traffic counts

– Exposure measure

EXAMPLES →

Traffic conflict study

e.g. based on hypothesis from accident analysis

EXAMPLE: TRAFFIC CONFLICT STUDY

EXAMPLE: TRAFFIC CONFLICT STUDY

Data reduction

Intersection	Original length (hours)	Reduced to (hours)	Reduced to (%)
1	80	3	4%
2	80	7	9%
3	80	12	15%
4	80	17	21%
5	80	25	31%
Total	**400**	**64**	**16%**

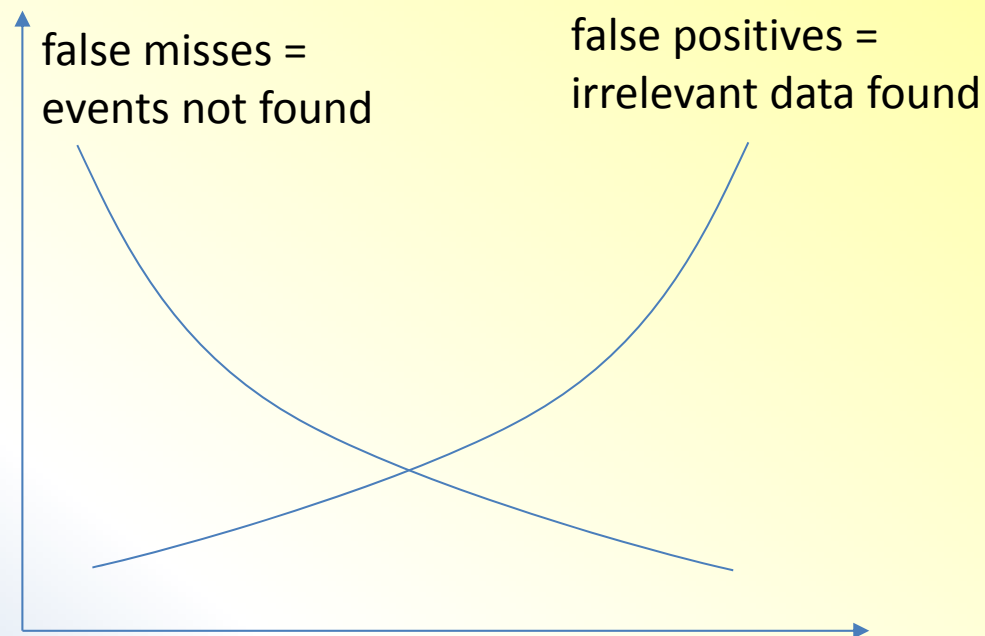Variation due to different complexity (weather conditions, infrastructure)

EXAMPLE:
CYCLISTS CROSSING IN WRONG DIRECTION

Cyclists crossing the road ouside crossing facility

False positives and false misses

false misses =
events not found

false positives =
irrelevant data found

Occlusion and traffic counts

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Thank you very much for your attention!

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Peter M. Christensen
Chris H. Bahnsen
Morten B. Jensen
Thomas B. Moeslund
Harry S. Lahrmann