ZDA the Detector project

project goal: to learn how different detectors work, practice real world installation measure the data and compare them with "ground truth".

Project detectors

Fig 1. Project detectors

Available detectors:

- GPS unit ([web resource](#), available at Konviktska room 514a)
- pneumatic detector ([web resource](#), available at Konviktska room 509)
- magnetic detector ([web resource](#), available at Konviktska room 509)
- radar ([web resource](#), available at Konviktska room 509)
- combined detector ([course resource](#), available at Konviktska room 509)
- videodetection ([course resource](#), available at Konviktska room 509)

Detectors are available in the laboratory in Konviktská 20, 5th floor (room 509) and should remain there, however there is a lot of room to play with them.

Project description

1. the class shall make groups of 3 students (2015: 6 groups)
2. each group picks a detector(s). available 4 types of measurement are
   a. Type A: GPS unit
   b. Type B: video detection
   c. Type C: combined detector
   d. Type D: radar + pneumatic|magnetic
3. there shall be
   a. 2-3 site measurements (2 groups together)
      i. site measurement 1: highway setup (**obligatory**)
         1. type B: videodetection
         2. type C: combined detector
      ii. site measurement 2: urban setup (**obligatory**)
         1. type B: videodetection
         2. type D: radar + (pneumatic|magnetic)
   b. 1-2 individual measurements (1 group alone)
      i. individual measurement 1: (**obligatory**)
         1. type A: GPS
      ii. individual measurement 2:
         1. type D: radar + (pneumatic|magnetic)
4. each group will familiarize with the equipment and make successful **laboratory** trials (assembly and getting all possible data from it)
5. site measurements are meant for two groups - the idea is to do group measurements together and compared the results
6. individual trials are meant for single groups - no comparison of measured data
7. site measurements will/shall be supervised by teacher. There are two scenarios, and some initial possibilities, students are however encouraged to find their own "spots":
   a. highway setup: detectors (**b+c**) installed on overpass, possibilities are:
      i. [D11 overpass Bořetická 20 Praha](#)

ii. [Kbelská pedestrian overpass, Praha](#)
    b. urban setup: detectors (**b+d**) installed next to road, possibilities are:
        i. [park next to Divadelní, Praha](#)

8. data from individual trials with GPS will be compared against each other and with additional device
9. data from site measurement will be compared within the a site (b+c and b+d)
10. each group will produce a report containing, (some groups have already report from last time, so improve a and b part of it!) :
    a. detector description, requirements and data outputs
    b. assembly instructions!
    c. onsite measurement
    d. measured data evaluation (as for the traffic parameters)
    e. measured data comparison (at least a try)

Real measurement with detectors

For the real test several preconditions have to be met. This chapter contains description of what individual groups shall do.

Preconditions

- mind the **battery -** have it "full"
- mind the **mounting** equipment - to secure it to the pole, railing
- mind the **cables** - to have it neat! net as a nest of wires

Group A - GPS

- spot measurement in different modes to get accuracy. Use [FD GPS](#) + another GPS source … phone with app?
- path measurement ride tram 17 from Národní divadlo to Vozovna Kobylisy and back, use new trams with "back seating". Use [FD GPS](#) + another GPS source … phone with app?
- load and display data in GIS (QGis, ESRI product, MapInfo)
- compute spot errors
- compare "own" track measurements against each other
- compare track measurements with other group

Groups B, C, D

- spot measurement site setup together with other group (b+c and b+d)
- compute traffic data in intervals? intensity, occupancy, speed, headway, length, classification, etc.
- compare measurements with other group

Course / project schedule

Part 1

- 13.3.2015 - detector lecture
- 18.3.2015 - assignment day (detectors shall be selected by groups)
- 20.3.2015 - first "play" with detectors
- 27.3.2015 - detectors shall be working (prepared to go outside!)
- … outdoor measurement
- 13.4.2015 - assignment delivery (written report)

Part 2

- 17.4.2015 - data processing lecture 1
- 24.4.2015 - data processing lecture 2
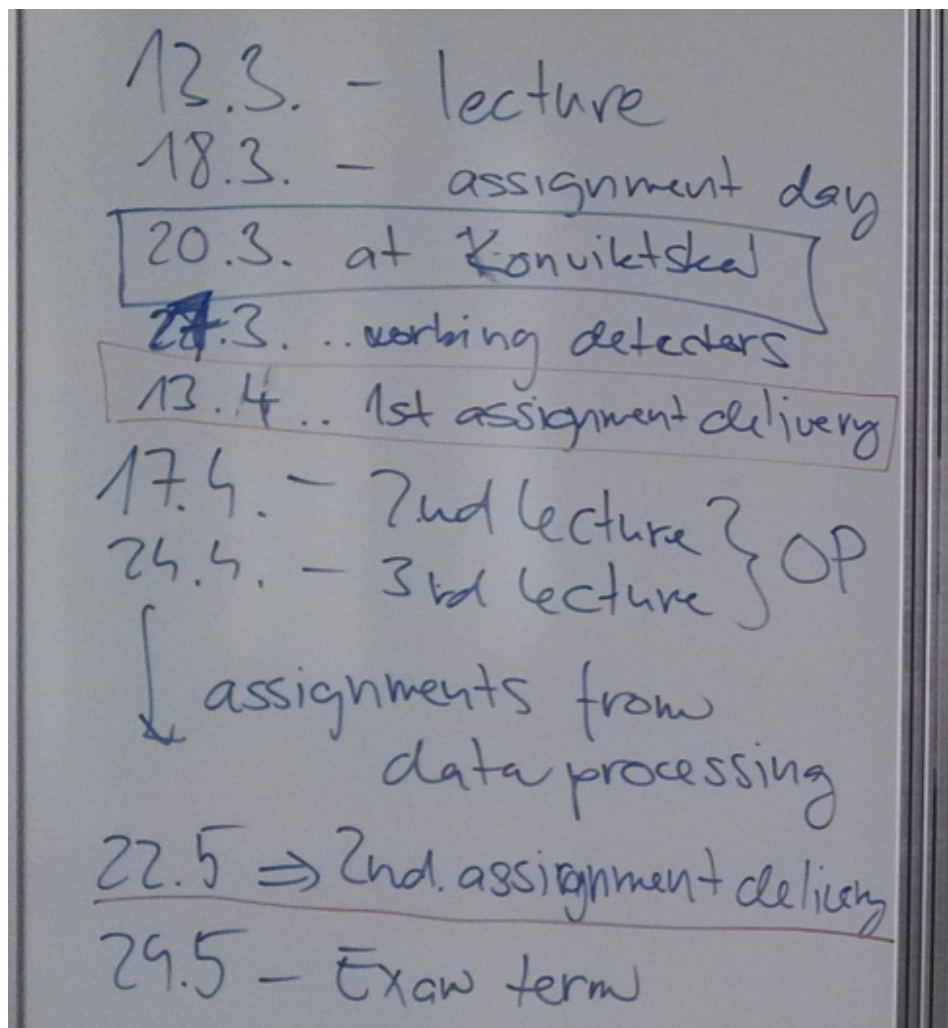- … assignment
- 22.5.2015 - assignment delivery (report)
- 29.5.2015 - exam term (test)

Fig 2. Course / project schedule