



**Preliminary Program
TRAX first Summer School,
Linköping 2014**

Tuesday 23/9

Place: Signalen, House B, Entrance B27 at LiU

11.15 KLM shuttle arrives at Linköping Airport,

11.20 Bus transfer to university

11.40-13.00 Lunch at the faculty club

13.00-13.15 Welcome opening of summer school

13.00-15.00 Partner presentations, with focus on TRAX challenges.
8x15 minutes

15.00-15.30 Coffee break

15.30-16.00 Lab introduction and preparations

16.00-17.00 Data collection at the university

17.00 - late City orienteering including more data collection

17.00 Bus transfer to city center

Wednesday 24/9

Place: Signalen, House B, Entrance B27

08:30 Bus transfer from the hotel to the University

9.00-10.30 Tracking in complex indoor environments

10.30-10.45 Coffee

10.45-12.00 Tracking in complex indoor environments

Program:

- Bram Dil, LiU (UTwente): Hardware overview on radio measurements
- Fredrik Gunnarsson, Ericsson: Sensor models for radio measurements
- Fredrik Gustafsson, LiU: Sensor fusion for indoor localization and tracking
- David Törnqvist and Per Skoglar, SenionLab: Future challenges in indoor positioning systems
- Jouni Rantakokko, FOI and KTH: Applications for rescue personnel

12.00-13.00 Lunch

13.00-15.00 Fellow presentations.

15.00-15.30 Coffee with sandwich

15.30-17.00 Fellow presentations

17:30 Bus transfer to the museum

18.00 A night at the airport museum

18.15 Group photo

18.30 Welcome drink and guided tour

20.00 Dinner

22.30 Bus transfer from the museum to the hotel

Thursday 25/9

8.30 Bus transfer from the hotel

9.00-10.30 Parallel sessions:

- Consortium meeting. *Place: Systemet, House B, Entrance B27, upstairs*

- Laboration session for fellows. *Place: TBA*

10.30-11.00 Coffee

Place: Signalen, House B, Entrance B27

11.00-12.00 Jonas Nilsson, LiU Innovation Office: Entrepreneurship and Innovation

12.00-13.00 Lunch

13.00-14.00 Johan Moe, Ericsson: Project Management in Software development

14.00-14.45 Patent attorney and Fredrik Gunnarsson: Patents and IPR

14.55-15.00 Closing remarks

15.00-15.30 Coffee

15.20 Bus transfer from the university to the airport

17.05 KLM shuttle leaves to Amsterdam

Laboration:

Data collection will be performed by our own 'sensor fusion' app for Android. The current version on Google Play does not support RSS measurements, but a stable version with RSS (WiFi and radio) will be released before the summer school. We have a few smartphones to lend, but without SIM cards so radio RSS will be missing, so use your own ones if possible! We provide conversion files from internal data format to a convenient Matlab mat-file.

Each fellow should after Tuesday have two datasets:

- A. Indoor RSS (WiFi, radio) and inertial data
- B. Outdoor data of GPS, radio RSS and inertial data

During the city orienteering, each participant runs the Sensor Fusion app in the background for collecting GPS and inertial data.

The lab includes two exercises:

TRAX



- A. RSS measurement analysis, construction of a simple fingerprint map, and design of PF for localization indoors.
- B. Design of an EKF for outdoor localization, that removes GPS outliers and provide a filter/smoothing solution. Analysis of how radio RSS varies with position in outdoor environments.