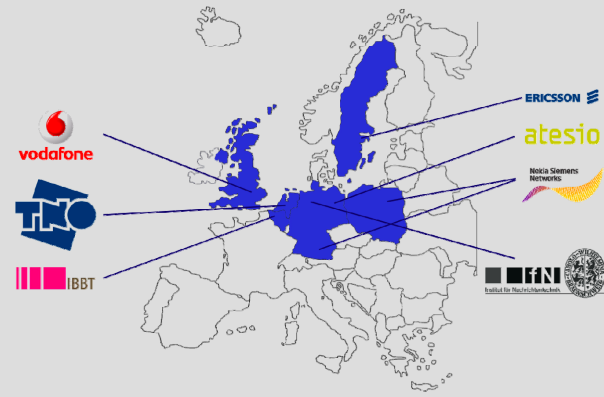


EU FP7 STREP SOCRATES

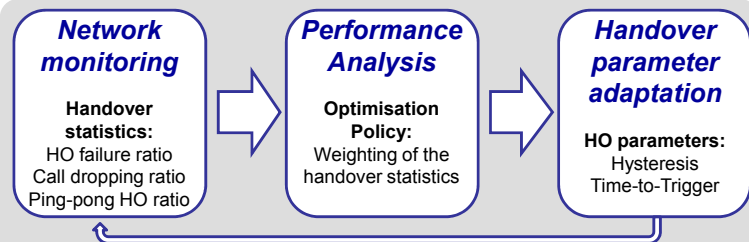
Self-Optimisation and self-ConfigURATion in WirelEss networkS

Handover (HO) parameter optimisation

- **Thomas Jansen** (Technische Universität Braunschweig)
- **Irina Balan** (Interdisciplinary Institute for Broadband Technology)
- **John Turk** (Vodafone)



Use Case Goals and Approach



Goal:

- Improved handover performance
 - Reduced number of handover failures
 - Reduced number of “ping-pong” handovers
 - Reduced number of call drops

Approach:

- Optimisation based on handover statistics
- Analysis of the current handover performance
- Adaptation of handover control parameters

Simulator / Demonstrator Setup

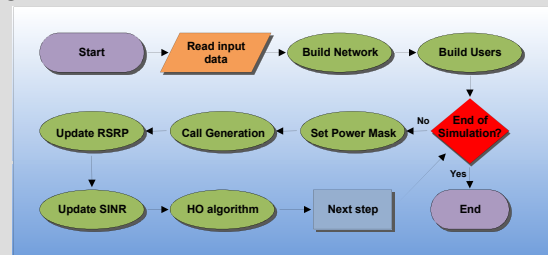
Network

- LTE FDD, 2.6 GHz, 10 MHz bandwidth
- Realistic network layout: Vodafone site data from a European city
- Realistic pathloss data (10m/100m resolution)

User mobility

- Microscopic road traffic simulator (SUMO)
- Detailed model (traffic lights, diff. speed, ...)

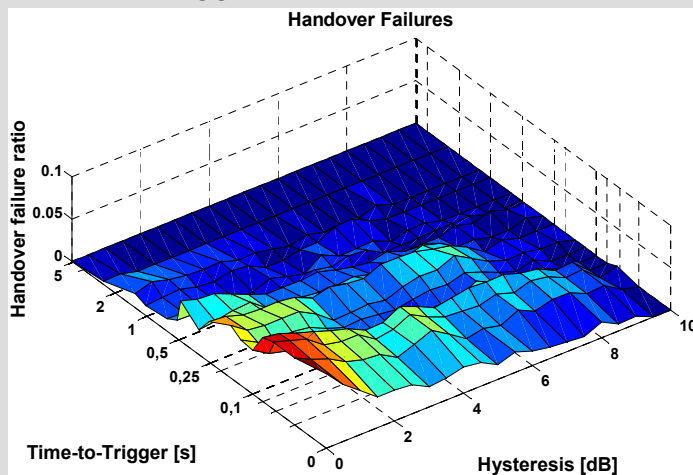
LTE System-level simulator



Observability Study / Results

Analysis of the handover performance in all handover operating points

- Hysteresis: 0 – 10 dB (0.5 dB steps)
- Time-to-Trigger : 0 – 5.12 s (18 steps 3GPP)



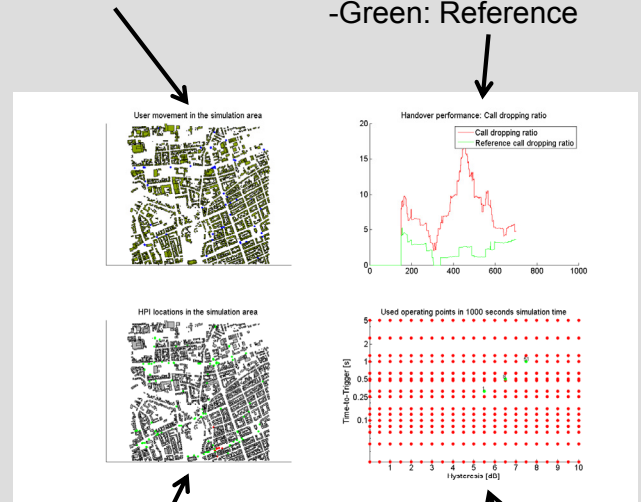
Weighting function for all handover performance indicators:

$$HP = w_1 HPI_{HOF} + w_2 HPI_{HPP} + w_3 HPI_{DC}$$

Demonstrator – what is shown

User movement in the scenario

Handover performance:
-Red: Optimization
-Green: Reference



HPI locations:

- Green: Successful handovers
- Red: Call drops
- Blue: Ping-pong handovers

Handover operating points of the cells