



IN THE NETWORKED SOCIETY  
PEOPLE, KNOWLEDGE, DEVICES,  
AND INFORMATION ARE  
NETWORKED FOR THE GROWTH OF  
SOCIETY, LIFE AND BUSINESS.

The Networked Society is  
when people, business and  
society are using connected  
devices to their benefit.

## Master's Thesis: **Development and evaluation of indoor positioning algorithms**

### Description:

Ericsson Research, which provides Ericsson with system concepts, technology and methodology, to secure long term competitive products. We drive world-class innovation through cooperation within Ericsson and with partners, customers, universities and research institutes.

### Purpose/background:

Already today, the majority of wireless network traffic is generated indoors. One way to meet the large indoor capacity needs is to deploy dedicated indoor networks. These indoor deployments opens up for indoor positioning of users and traffic for emergency call localization as well as detailed geo-localized performance monitoring. Indoor positioning is different from outdoor positioning in that there is typically an important vertical positioning component. Furthermore, network based solution requirements are typically tighter, since requirements are typically set relative the building and cell size (where cells are smaller for indoor networks). The purpose of this thesis is to develop 3D-positioning algorithms for devices located indoor. The developed network-based algorithms will be based on various radio network measurements from systems (primarily 3GPP LTE or 4G) deployed indoors in order to generate position estimates.

### Thesis description:

This Master Thesis aims at investigating and develop some network based indoor positioning mechanisms for buildings where we have network equipment installed, either pico base stations or radio heads. The work will mix theoretical work with simulation evaluations, based on existing or emerging Ericsson radio network products. Since the work will focus on modeling, signal processing, and sensor fusion algorithms including assessed complexity aspects, a strong theoretical background in this area is recommended.

### Competence:

This project aims at Mater of Science (civilingenjör) students in electrical engineering, computer science, or computer engineering. Matlab is our primary tool for modeling and simulation work, and excellent Matlab and programming skills is a must. Background in signal processing and telecommunication is preferred. Applicants with less than B/4.0 in average grade will not be considered.

Extent: 1 student, 30 hp  
Apply before: Dec 1<sup>st</sup> 2013  
Preferred starting date: Jan 15<sup>th</sup> 2014  
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