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Background

Wireless Access Networks (WAN) is a unit in Ericsson Research investigating future generation wireless communications. Our applied research lab in Kista, Stockholm, is involved in implementing new concepts, algorithms and mechanisms to be tested under real radio conditions.

This is a MSc. Thesis project in collaboration with Associate Professor James Gross at the KTH School of Electrical Engineering, Stockholm. The project involves hands-on implementation where prototyping is to be done on the Wireless Open-Access Research Platform (WARP) boards (see <http://warp.rice.edu>). Background information and technical support on the implementation platform and environment will be provided throughout the project.

Assignment

Wireless LAN or Wi-Fi is a tremendously successful radio communication technology. Operating in the ISM frequency bands, Wi-Fi networks are typically deployed independently, without any central coordination, control or monitoring. As such, while it is relatively trivial to discover which Wi-Fi channels are being used, it is extremely challenging to estimate how much of a specific channel is being utilized.

This thesis project aims to investigate Wi-Fi channel utilization mechanisms. Estimation techniques may be based on simple time-series analysis of received radio-signal energy, or more elaborately by investigating wireless packet headers observed over the air, or other more innovative methods altogether.

The successful candidate is expected to build up background knowledge on the existing IEEE 802.11 WLAN protocol. With this knowledge, the candidate will be given a free reign to propose ideas and algorithms which may be used to estimate channel utilization. The student is strongly encouraged to propose innovative and novel solutions to achieve the desired results. He or she is then expected to implement the ideas on our WARP platform, perform device tests, carry out measurements and evaluate the results of these proposed ideas. The Ericsson supervisor, as well as KTH collaborators, will be available for guidance and technical support throughout this process.

The implementation is to be done in the C programming language, and will run on the WARP boards in our lab, engaging in live over-the-air measurements. Development is expected to take place in an agile and iterative manner where modifications to an initial algorithm implementation may be needed, resulting in reiterations of the implementation-measurement steps, until a satisfactory final solution is converged upon.

Deliverables

Deliverables expected at the end of the thesis project include clearly documented working code, a final thesis report, and a live demonstration-presentation of the final implementation and outcome to an Ericsson audience. Note that these are in addition to KTH's thesis requirements.

Qualifications

We are looking for a self-motivated and creative student with the following qualifications;

Master student at the School of Electrical Engineering, KTH.
Fluency in English
Excellent analytical skills
Hands-on programming experience, preferably in C
Ability to work independently

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Useful Links

<http://www.ericsson.com/thecompany>

http://www.ericsson.com/thinkingahead/networked_society

Application

The position is based in Kista (Stockholm) and is applicable for one student.

Please submit your application in English as soon as possible - we are working continuously with candidate selection. Application end date is 13th of September.

For specific questions please reach out to:

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