

Empreses on pots fer el PFC

Empreses i Institucions que ofereixen projectes a l'ETSETB i que gestiona l'escola Última actualització: 17 d'octubre de 2012

Quan demaneu una plaça mitjançant l'Intranet, ho haureu de fer en referència al codi que surt a la taula.

ATENCIÓ: hi ha empreses que continuament estan ofertant projectes. Un dels requisits és que els has de sol·licitar pel teu compte, però pots demanar-nos qualsevol document que et sol·licitin i tingui a veure amb l'escola. Consulta aquí quines són.

Nokia Siemens

TriaGnoSys GmbH

DLR – German Aerospace Centre, Institute of Communications and Navigation

Bell Laboratories

Nokia Siemens

Nokia Siemens, Aalborg, Denmark

Codi	DK NSN Aal_1
Data d'entrada	05.10.12
Tipus d'estada	PFC
Descripció	LTE-Advanced HetNet Investigations Under Realistic Conditions The next big leap in cellular system performance improvement will be obtained by changing the topology of traditional networks from macro-only to heterogeneous networks (HetNets). This raises the questions on how small cells are most efficiently introduced, and how to integrate them with the macro layer so that the overall system performance is maximized. The topic of this project is to evaluate LTE-Advanced HetNet performance by means of system level simulations, where a real HetNet environment from an operator is loaded. This includes having real topology maps with realistic base station locations, user traffic density, and propagation data from three-dimensional ray tracing tools. The study will be carried out in close cooperation with local research group at Nokia Siemens Networks, assisting with expertise on simulation tools and analysis of LTE-Advanced HetNet scenarios.
Inici	End of January 2013
Durada	8 months
Requisits	General insight to communication systems (operation, architecture, protocols, etc.), good knowledge about wireless propagation (incl. stochastic processes), C++ and MatLab programming
Nombre de places	2
Compensation	a compensation will be given

Codi	DK NSN Aal_2
Data d'entrada	05.10.12
Tipus d'estada	PFC
Descripció	Integration of WiFi and Beyond 4G Radio Access Technology The exact project description is not available at the moment, but the project will entail modelling and simulation work using an existing C++ based simulation framework.
Inici	End of January 2013
Durada	8 months
Requisits	General insight to communication systems (operation, architecture, protocols, etc.), good knowledge about wireless propagation (incl. stochastic processes), C++ and MatLab programming
Nombre de places	2
Compensation	a compensation will be given

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TriaGnoSys GmbH

TriaGnoSys GmbH, Wessling-Oberpfaffenhofen. Germany

Codi	D TriaGnoSys Wess-1
Data d'entrada	05.10.12
Tipus d'estada	PFC

	<p>Efficient Database Synchronisation for Management of Disaster Events</p> <p>Context and Background This diploma thesis is based on the ongoing research on emergency communications by TriaGnoSys. In case of a disaster event, the terrestrial commercial communication networks are likely to be overloaded, damaged or inoperative, if they ever existed. This disables communications between the emergency teams deployed in the field making impossible any kind of effective coordination. In order to provide reliable communication means to the rescue forces a fast deployable and independent network is foreseen. This network offers GSM, TETRA and WLAN connectivity for the rescue personnel in the area and backhauls over satellite the whole voice and data traffic to a disaster-safe area. In the general case, several of such rapid deployment units will be on the field, with a number of end user terminals accessing them in heterogeneous ways to upload data collected on the field to the distributed databases hosted on the units. The 'backbone/backhaul' network itself is dynamic in its topology and presents a highly complex situation for the synchronization of database information in the whole emergency communications network. Based on lessons learnt from preliminary implementations and tests, several areas for required or appealing further improvements have been identified. Some include the efficient synchronization of the databases hosted in the field units or the transmission of the database to nodes located in a safe area by using a satellite link. At the moment TriaGnoSys is already studying possible solutions to these problems, some of which will probably be integrated forming a complex process. It is foreseen that the final solution includes different processes to synchronize the database, and each of them is used in different moments or places according to a multiple-criteria decision metric (criteria are for instance bandwidth available, amount of new information to be transmitted, etc). Statement of Work: The work to be performed will include some of the following tasks: - Study and understand the current issues and the existing design and software implementation; - provide new ideas or improvements to the existing solutions; - implement selected components of the integrated solution, depending on a systematic priority list which will emerge from the ongoing conceptual studies and simulations; - write a self-contained scientific report (diploma thesis), comprehensively summarizing the work performed. The thesis is to be written in English.</p>
Descripció	
Inici	The preferred starting date is in the first quarter of 2013.
Durada	6 months
Requisits	Prerequisites for interested candidates are: - Medium to advanced English language proficiency - Basic to advanced knowledge in C/C++ and other programming languages - Familiar with IP networking on Linux. A high level of commitment, engagement, and independent research capability are expected from the candidate performing this work; however, the challenge of the task can only be appropriately met by excellent team work, which shall be guaranteed by close contact and regular discussion among candidate and supervisor throughout the whole period.
Nombre de places	1
Compensation	a compensation will be given
Codi	D TriaGnoSys Wess-2
Data d'entrada	05.10.12
Tipus d'estada	PFC
	<p>Survey and Design of Jamming Countermeasures for aeronautical Wireless Sensor Networks</p> <p>Context and Background For operations and maintenance of future commercial aircraft, there is a significant potential for efficiency increase and cost reduction by using Wireless Sensor Networks (WSNs) onboard aircraft that could completely or partially replace current wired infrastructure. Within this context, TriaGnoSys participated with other German companies in a research project which developed a proof-of-concept testbed with tenths of wireless sensor nodes demonstrating several aeronautical applications. Nevertheless, lots of challenges are still to be addressed before the use of WSN technology can be a reality in the aeronautical market. One of them is the robust operation of the on-board WSN in front of interference or jamming. This is the topic to be investigated within the Diploma Thesis described hereafter. Statement of Work: The concrete works to be performed include the following (not preventing adaptations and flexible reaction to lessons learnt while performing the work): • Study and understand the radiation characteristics of an aeronautical WSN, of both types of nodes (coordinator and sensor nodes) • Model the radiation characteristics of aeronautical WSN cells in several aircraft areas (cabin, cargo, structure, etc.) • Review literature of aeronautical system operating in bands co-existing with the aeronautical WSN • Identify and classify jamming sources for aeronautical WSN • Survey jamming and jamming countermeasure for other electromagnetic systems (GSM, GPS, etc.) • Propose appropriate jamming countermeasures for aeronautical WSN and evaluate their feasibility The work will be carried out with the support of a supervisor. Adaptations to the methodology and objectives described above, as well as flexible reaction to lessons learnt while performing the work might occur. Eventually and depending on the parallel development of a large scale aeronautical WSN testbed, the actual radiation of wireless sensors nodes may be measured. In this case, the work might be combined with some practical tasks like configuring and testing the radiation properties of the wireless sensor nodes.</p>
Descripció	
Inici	The preferred starting date is in the first quarter of 2013.
Durada	6 months
Requisits	The thesis is to be written in English. It is envisaged to jointly submit key results of the diploma work as a paper for an international conference and/or a journal paper. Analytical and problem solving skills. Interest on propagation, radiocommunications, cellular networks, electromagnetism, etc. A high level of commitment and engagement is expected from the candidate performing this work; however, the challenge of the task can only be appropriately met by excellent team work, which shall be guaranteed by close contact and regular discussion among candidate and supervisor(s) throughout the whole period.

Nombre de places	1
Compensation	a compensation will be given
Codi	D TriaGnoSys Wess-3
Data d'entrada	05.10.12
Tipus d'estada	PFC
Descripció	<p>Preventing connectivity to ground LTE networks from airborne in-cabin UEs through steering of roaming</p> <p>Background The Long Term Evolution (LTE) is one of the latest mobile cellular communication standards developed by the 3rd Generation Partnership Project (3GPP). LTE is considered by a large sector of the telecommunications industry as the standard on which future mobile voice/data connections will be based. The core LTE specifications were frozen in 3GPP Release 8 during December 2008, although they continue to evolve in further releases. Among the long-term objectives of TriaGnoSys, the provision of on-board LTE connectivity to passenger and crew members is envisaged. In the future, this will enable the on-board wireless access to local content as well as off-board connection possibilities. Stable and reliable on-board LTE connectivity requires that on-board UEs connect to the on-board LTE network (i.e. the visited network from the UEs perspective) rather than to ground networks (i.e. the home network). Therefore, a method needs to be devised to guarantee that on-board UEs remain connected to the on-board visited LTE network.</p> <p>Objectives</p> <ol style="list-style-type: none"> 1. To learn about the Public Land Mobile Network (PLMN) selection procedure in LTE. 2. To learn Steering of Roaming (SoR) techniques and how to implement them. 3. To design one or more SoR-based methods to avoid connectivity to ground networks from airborne UEs. 4. To investigate the implementation feasibility of the proposed solutions. <p>Methodology</p> <ol style="list-style-type: none"> 1. Studying the LTE fundamentals. 2. Studying SoR techniques. 3. Researching existing similar approaches to LTE SoR. 4. Analyzing the ground-connectivity problem from an LTE perspective and proposing solutions through SoR or other techniques. The work will be carried out with the support of a supervisor. Adaptations to the methodology and objectives described above, as well as flexible reaction to lessons learnt while performing the work might occur. <p>Month 1: Study of LTE & SoR Literature review Months 2-3: Continued literature review Proposition of draft techniques Mid-term presentation Month 4-5: Continued literature review Refinement of proposed techniques Month 6: Final draft of techniques Final presentation</p>
Inici	The preferred starting date is in the first quarter of 2013.
Durada	6 months
Requisits	Analytical & problem-solving skills. Mathematical thinking. High English level. Basic knowledge of cellular networks (desired).
Nombre de places	1
Compensation	a compensation will be given

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DLR – German Aerospace Centre, Institute of Communications and Navigation

DLR – German Aerospace Centre, Institute of Communications and Navigation, Oberpfaffenhofen-Wessling, Germany

Codi	D DLR Wess-1
Data d'entrada	05.10.12
Tipus d'estada	PFC
Descripció	<p>Random access for improving return link performance with sporadic traffic in GEO satellite networks</p> <p>The performance of TCP degrades severely over satellite links, since the throughput of this protocol is inversely proportional to RTT. On one hand, Demand Assigned Multiple Access (DAMA) methods assign users variable time-slots matching user information transmission requirements. Moreover, DAMA-based systems have full control and overview of the system resources. Although these protocols show significant system improvement, they have several drawbacks, e.g. the delay due to the signaling procedure, also the overhead of the signaling messages. Considering an application scenario with light traffic load in uplink, Random Access (RA) schemes are valid approaches to mitigate RTT issues. RA methods show low latencies, especially when they implement Successive Interference Cancellation (SIC). This concept is believed to further reduce the delay by means of recovering from collisions, if one of the collided packets is known. The aim of this thesis is to analyze in terms of theory and simulation the performance of TCP (mice or elephant connections) over satellite links implementing random access techniques with SIC on the return channel. Towards this end, maximum throughput and stability issues will be investigated. The goal is to show that the delay seen by TCP using these methods is not critical and can improve its performance. The expected output of this task is a functional implementation (in NS-2) of innovative random access methods. Further, the overall system performance should be analyzed in order to support the simulation results. Tasks: Protocol implementation (+Documentation), protocol testing and evaluation.</p>
Inici	
Durada	6-8 months

Requisits	Background knowledge of radio communications systems and communications networks. Background knowledge of satellite communications - desired. Background knowledge on network programming. Programming Languages: C/C++, Matlab. Operating System: Linux. Fluency in English
Nombre de places	1
Compensation	a compensation will be given
Codi	D DLR Wess-2
Data d'entrada	05.10.12
Tipus d'estada	PFC
Descripció	<p>Software Defined Radio for Space Communication Downlinks</p> <p>Traditionally all components of a radio communication system have been implemented in hardware. Hardware implementations are reliable and fast but they are also costly and highly inflexible. In the last decade the increase in computing power of processors has made it possible to replace most of the hardware components with software. The key advantage of a software defined radio (SDR) is its enorm flexibility, which makes possible introduce modifications in a short time (i.e. due to an update in communication standards).</p> <p>Receivers for the downlink of space communications systems are subject to strict quality standards and are usually implemented in hardware. The malfunctioning of some component of the communications system, such as the antenna of a space probe or satellite, may require a modification of the receiver algorithms and or transmitter waveform and a full redesign of the hardware receiver on ground, which takes years of work. For this reason it is appealing to develop a fully Software Defined Radio complying with the latest communication standards for satellite communications, whose flexibility can guarantee the safety of present and future space missions.</p> <p>Tasks: Development of a Software Defined Radio Receiver for Space Communications complying with CCSDS standards.</p>
Inici	
Durada	6-8 months
Requisits	Good knowledge of Digital Communication Systems (Modulation, Channel Coding, Channel Estimation). Proficient in Matlab, C and C++. Proficient in English. Ability to work in a Multicultural Environment.
Nombre de places	1
Compensation	a compensation will be given

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Bell Laboratories

Bell Laboratories (Alcatel•Lucent). NJ, USA

Codi	USA ALCATEL-LUCENT_NJ_1
Data d'entrada	17.10.12
Tipus d'estada	PFC
Descripció	Optics Communications
Inici	Februrary 2013
Durada	9 months
Nombre de places	1
Compensations	A compensation will be given

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