PFC a Empreses (Tardor 2009-10)

Empreses on pots fer el PFC

Empreses i Institucions que ofereixen projectes a l'ETSETB i que gestiona l'escola
Última actualització: 10 Febrer 2008

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

ATENCIO: 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.

CEA-Leti (CEA: Comissariat de l'Energia Atòmica)

Telecom Itàlia

NXP Semiconductors / Corporate I&T / Research

EPFL

Philips Technologie GmbH Forschungslaboratorien

Nokia Siemens

NEC

Ericsson GmbH

BERTRANDT

DLR

Philips Research Europe

TriaGnoSys GmbH – Wessling

Thales Nederland

CEA-Leti (CEA: Comissariat de l'Energia Atòmica)

CEA-Leti – Grenoble. France. (CEA: Comissariat de l'Energia Atòmica)

Codi	F CEA Gre_1
Data d'entrada	17/02/09
Tipus d'estada	PFC
Descripció	**Development of distributed coding and HARQ techniques for cooperative networks OFDMA based.** There is an intense research activity concerning distributing coding and hybrid retransmission schemes into the wireless networks(UMTS, HSDPA, WiMAX, WiMAX2, LTE, LTE-Advanced, etc.) domain. Distributed turbo code has been proposed by Zhao and Valenti in 2003 as a strategy to achieve high performance through spatial diversity. In DTC, the source broadcasts the convolutional coded signals to both the destination and relay. The relay then decodes the received signals, and interleaves them prior to encoding. Source and destination have cooperatively constructed a distributed turbo code. The advantage is twofold : decoding complexity at the relay is minimized (the relay received message is only a convolutional codeword) while performance at the destination is increased by the turbo code interleaving and iterative decoding gains. This scheme is very suitable for non-ergodic block fading channel where system performance is due to the experienced diversity gain. Otherwise HARQ protocols permit, with smart retransmissions and combining schemes at the detector, to achieve the desired packet error rate. In a first HARQ strategy the source retransmits the undetected packet, at destination both the packets are optimally combined prior to decoding. In a different scheme (Incremental redundancy) different parity bits are sent in each retransmission. At destination no combining is performed while a more reliable codeword is constructed. This research subjects are widely studied, but a jointly optimization of this strategies, which could offer higher performance in terms of QoS and transmission rate, has never been deeply considered. ***Stage goals:*** -Realize a simulation environment for an OFDMA scenario to evaluate the advantages and the disadvantages of the proposed distributed coding and HARQ techniques. -Theoretic analysis of different coding schemes for a relay channel. -Propose several coding strategies considering different evaluation metric (link quality, complexity at the relay...). -Compare in an OFDMA context the proposed techniques with the strategies already present in literature. -Realize distributed channel coding schemes combined with distributed retransmission protocols. -Evaluate the performance of the proposed distributed coding and HARQ strategies in the different considered scenarios.
Durada	6 months
Requisits	Telecommunications
Nombre de places	1

Codi	F CEA Gre_2
Data d'entrada	17/02/09
Tipus d'estada	PFC
Descripció	**Study of centralized scheduling techniques based on relays' selection for OFDMA cellular system (LTE).** Modern wideband communication systems present a very challenging multi-user communication problem: many users in the same geographic area will require high on-demand data rates in a finite bandwidth with a variety of heterogeneous services such as voice (VoIP), video, gaming, web browsing and others. Emerging broadband wireless systems such as WiMAX and 3GPP/LTE employ Orthogonal Frequency Division Multiple Access (OFDMA) as the basic multiple access scheme. Indeed, OFDMA is a flexible multiple access technique that can accommodate many users with widely varying applications, data rates, and Quality of Service (QoS) requirements. Because the multiple access is performed in the digital domain (before the IFFT operation), dynamic and efficient bandwidth allocation is possible. Therefore, this additional scheduling flexibility helps to best serve the user population. Diversity is a key source of performance gain in OFDMA systems. In particular, OFDMA exploits multiuser diversity among the different users, frequency diversity across the sub-carriers, and time diversity by allowing latency. Furthermore coverage problem at cell's border is another great challenge in 3GPP/LTE. Recenly (2008) the LTE group has chose a Cooperative Relay Based architecture like as an appealing solution to solve this problem. Thus the relay's introduction add more complexity to the system and how work out this complexity is not still focused on 4G cellular networks. ***Required work:*** In the first part of the internship, the candidate has to propose methods to evaluate for each mobile user, the necessity of cooperation for the transmission/reception of their packets. In the second part, this internship is focalised on the study of methods utilized to identify dynamically the best set of relays available for a cooperative transmission. How to find the best relays' set is to define: based on the physical distance (between relay, base station and mobile user); based on loss of propagation; other criterias. In the last period, the candidate has to suggest a scheduling algorithm that takes in account jointly the user's priority and the cooperation diversity.The most promising solution will be evaluated with computer simulations (Matlab and/or preexistent simulator in C/C++). The *objectives* of this stage are multiples: ·　　Define a method for identify dynamically the set of best relays. ·　　Understand the compromises between resource allocation for traffic packets and resource allocation for cooperative resource allocation ·　　Propose methods that select users that need cooperation. ·　　Propose a scheduling algorithm that takes in account jointly user's priority and cooperative diversity ·　　Comparative study at system layer of the different techniques proposed in terms of capacity, coverage and fairness among users.
Durada	6 months
Requisits	Telecommunications and informatics domains are required. Software like Matlab and programmation language like C/C++ will be utilized during the job.
Nombre de places	1

Codi	F CEA Gre_3
Data d'entrada	17/02/09
Tipus d'estada	PFC
Descripció	**Study of centralized scheduling techniques for a cellular communication relay based system in presence of mixed traffic.** Modern wideband communication systems present a very challenging multi-user communication problem: many users in the same geographic area will require high on-demand data rates in a finite bandwidth with a variety of heterogeneous services such as voice (VoIP), video, gaming, web browsing and others. Emerging broadband wireless systems such as WiMAX and 3GPP/LTE employ Orthogonal Frequency Division Multiple Access (OFDMA) as the basic multiple access scheme. Indeed, OFDMA is a flexible multiple access technique that can accommodate many users with widely varying applications, data rates, and Quality of Service (QoS) requirements. Because the multiple access is performed in the digital domain (before the IFFT operation), dynamic and efficient bandwidth allocation is possible. Therefore, this additional scheduling flexibility helps to best serve the user population. Diversity is a key source of performance gain in OFDMA systems. In particular, OFDMA exploits multiuser diversity among the different users, frequency diversity across the sub-carriers, and time diversity by allowing latency. Also traditional packet scheduling are mainly designed for homogeneous single traffic scenarios. In this scenario it could be necessary improve novel scheduling algorithms that support real-time (RT) andnon real-time (NRT) traffics at the same time (mixed traffic). Furthermore coverage problem at cell's border is another great challenge in 3GPP/LTE. Recenly (2008) the LTE group has chosen a Cooperative Relay Based architecture like as an appealing solution to solve this problem. Thus the relay's introduction add more complexity to the system and how work out this complexity is not still focused on 4G cellular networks. ***Required work:*** For the first period, in this internship the performances of different scheduling techniques proposed in literature have to be evaluated (MCI [2], PF[3], EDF[4] MLWDF[5], …) and applied on cellular cooperative OFDMA network in the following scenarios: ·　　Simple traffic (real time or not). ·　　Homogeneous mixed traffic Homogeneous (similar classes are active at same time). ·　　Heterogeneous mixed traffic (different classes are active at the same time)

In a second time, the candidate has to adapt the proposed algorithm [1] in the cooperative context and has to compare performance with the State of the Art.

After, the candidate could propose new scheduling algorithms cooperative based for the LTE-advanced scenario.The most promising solution will be evaluated with computer simulations (Matlab and/or preexistent simulator in C/C++).

The *objectives* of this stage are multiples:

·   Study of the performance of different scheduling algorithms proposed in literature in the case of homogeneous traffic and heterogeneous traffic.

·   Comparative system study of different scheduling algorithms applied in presence of cooperative networks for homogeneous and heterogeneous traffic.

·   Adaptation of the proposed algorithm [1] in the cooperative context and performances evaluation.

·   Proposition of new cooperative schedulers in presence of mixed traffic for LTE-advanced.

Durada	6 months
Requisits	Telecommunications and informatics domains are required. Software like Matlab and programmation language like C/C++ will be utilized during the job.
Nombre de places	1

Codi	F CEA Gre_4
Data d'entrada	20/02/09
Tipus d'estada	PFC
Descripció	**Study and development of telecom applications on a 4G telecommunication platform (2 or 3 internships).** The IAN laboratory (Integration of Digital Architectures) has developed a telecommunications platform implementing an innovative integrated circuit called MAGALI. This integrated circuit implements different heterogeneous processing resources (CPU, DSP …) organized around a interconnect fabric (Network-on-Chip NoC). These resources are optimized to meet the 4G telecommunication applications requirements (high bandwidth and high-performance processing) in the digital processing base band and highly reconfigurable to support different applications (WiFi, WiMAX, 3GPP-LTE …). Moreover, this circuit has the ability to execute multiple applications in parallel using the same hardware resources. ***Required work:*** In the first part of the internship, the candidate has to analyze the 4G telecommunication platform and learn how to program simple applications. In the second time, the candidate has to simulate some telecommunication applications and analyze its performances in the 4G telecommunication platform. Once the application validated, the application will be performed on the MAGALI integrated circuit. Finally, the hardware multi-application mechanism (resource sharing, bandwidth sharing…) will be used to execute simultaneously different telecom applications (WiFi, WiMAX, 3GPP-LTE).
Durada	6 months. Starting date: 1st internship: as soon as possible. Starting date: 2nd – 3rd internship: October-November 2009, up to February 2010.
Requisits	Final project of telecommunication engineering. Programming language: C, C++. Hardware architecture knowledge (recommended). Simulation: SystemC (will be appreciated). VHDL (will be appreciated). Signal processing: Matlab (will be appreciated).
Nombre de places	2-3

Codi	F CEA Gre_5
Data d'entrada	20/02/09
Tipus d'estada	PFC
Descripció	**Architecture design of a Multi-Processor System-on-Chip (MPSoc).** The IAN laboratory (Integration of Digital Architectures) is developing Multi-Processor System-on-Chip (MPSoC) architectures containing many processing elements (CPUs) in a single integrated circuit. MPSoC architecture is one of the candidates to solve the actual economic and technical barriers (design/mask cost, power consumption, clock speed, robustness to failure…) of the ASIC circuits. The IAN laboratory is currently exploring many topics in order to achieve a high performance MPSoC architecture, using low power consumption techniques, while adapting its performance to the environment (Process, Voltage, Temperature) conditions. Moreover, 3-dimensional (3D) stacking techniques are being studied in order to increase MPSoC memory.
Durada	6 – 9 months. Starting date: October - November 2009, up to February 2010.
Requisits	VHDL (mandatory).Digital circuit design (mandatory).SystemC simulation (recommended).
Nombre de places	1

Codi	F CEA Gre_6
Data d'entrada	20/02/09

Tipus d'estada	PFC
Descripció	**Low power consumption techniques for integrated circuit design.** The IAN laboratory (Integration of Digital Architectures) is developing Multi-Processor System-on-Chip (MPSoC) architectures containing many processing elements (CPUs) in a single integrated circuit. MPSoC architecture is one of the candidates to solve the actual economic and technical barriers (design/mask cost, power consumption, clock speed, robustness to failure…) of the ASIC circuits. The IAN laboratory is currently exploring many topics in order to achieve a high performance MPSoC architecture, using low power consumption techniques, while adapting its performance to the environment (Process, Voltage, Temperature) conditions. Moreover, 3-dimensional (3D) stacking techniques are being studied in order to increase MPSoC memory.
Durada	6 – 9 months. Starting date: October - November 2009, up to February 2010.
Requisits	Integrated circuit design (mandatory). VHDL-AMS (recommended). Spice simulation (will be appreciated). Low power techniques (will be appreciated).
Nombre de places	1

Codi	F CEA Gre_7
Data d'entrada	20/02/09
Tipus d'estada	PFC
Descripció	**Variability optimization (performance optimization of a digital integrated circuit under different Process, Temperature, and Voltage conditions).** The IAN laboratory (Integration of Digital Architectures) is developing Multi-Processor System-on-Chip (MPSoC) architectures containing many processing elements (CPUs) in a single integrated circuit. MPSoC architecture is one of the candidates to solve the actual economic and technical barriers (design/mask cost, power consumption, clock speed, robustness to failure…) of the ASIC circuits. The IAN laboratory is currently exploring many topics in order to achieve a high performance MPSoC architecture, using low power consumption techniques, while adapting its performance to the environment (Process, Voltage, Temperature) conditions. Moreover, 3-dimensional (3D) stacking techniques are being studied in order to increase MPSoC memory.
Durada	6 – 9 months. Starting date: October - November 2009, up to February 2010.
Requisits	Digital/Analog circuit design (mandatory). Spice (mandatory). Matlab (mandatory).VHDL (recommended). Back-End implementation of digital integrated circuits (will be appreciated).
Nombre de places	1

Codi	F CEA Gre_8
Data d'entrada	20/02/09
Tipus d'estada	PFC
Descripció	**Architecture design for 3D integrated circuits (memory will be stacked on top of the MPSoC circuit).** The IAN laboratory (Integration of Digital Architectures) is developing Multi-Processor System-on-Chip (MPSoC) architectures containing many processing elements (CPUs) in a single integrated circuit. MPSoC architecture is one of the candidates to solve the actual economic and technical barriers (design/mask cost, power consumption, clock speed, robustness to failure…) of the ASIC circuits. The IAN laboratory is currently exploring many topics in order to achieve a high performance MPSoC architecture, using low power consumption techniques, while adapting its performance to the environment (Process, Voltage, Temperature) conditions. Moreover, 3-dimensional (3D) stacking techniques are being studied in order to increase MPSoC memory.
Durada	6 – 9 months. Starting date: October - November 2009, up to February 2010.
Requisits	Digital circuit design (mandatory). VHDL (mandatory). Hardware architecture (recommended). Back-End implementation of digital integrated circuits (will be appreciated).
Nombre de places	1

Telecom Itàlia

Telecom Itàlia – Torino (Itàlia)

Codi	I TELECOM Tor_3
Data d'entrada	16/02/09
Tipus d'estada	PFC
Descripció	**Augmented Multi Media Reality.**
Durada	6/9 months

Requisits	Telecommunications
Nombre de places	1 - 2

Open positions in these areas of interest:

Codi	I TELECOM Tor_1
Data d'entrada	16/02/09
Tipus d'estada	PFC
Descripció	**IP project proposal PERVANETS.**
Durada	6/9 months
Requisits	Telecommunications

Codi	I TELECOM Tor_2
Data d'entrada	16/02/09
Tipus d'estada	PFC
Descripció	**Nanonetworks.**
Durada	6/9 months
Requisits	Telecommunications

Persona de contacte: Professor Josep Solé Pareta

NXP Semiconductors / Corporate I&T / Research

NXP Semiconductors / Corporate I&T / Research - Eindhoven (The Netherlands)

Codi	NL NXP Ein_1
Data d'entrada	17/02/09
Tipus d'estada	PFC
Descripció	**Embedded Video Compression for Usage in System-on-Chip.** Develop of a visual lossless video compression scheme, capable of achieving factor 6 compression on 36 bit video. In a digital video system, uncompressed digital video contributes considerably to the bandwidth usage. The bandwidth occupied by uncompressed video is reduced by applying video compression. Video compression has been a topic of research for the past decades aiming at the development of generic video coding schemes, resulting in a high compression ratio with a good picture quality. Modern System-on-Chip (SoC) addressing HD-television signals for consumer applications are also confronted with a high consumption of bandwidth by uncompressed video. To battle the bandwidth in such a SoC, embedded video compression is applied. This becomes even more relevant for the situation in the nearby future where the number of bits per sample will be further increased resulting in 36 bits per sample. Taken into account the increase in frame rate, video traffic will be the dominant factor in a SoC. With embedded video compression the focus lays on extreme high video quality and a modest compression ratio.
Durada	The work will be conducted in a nine month period at the HTC The Netherlands. Start date June/July 2009.
Requisits	Signal processing. Have affinity with video, image processing and data compression. Desire to acquire new knowledge. Motivated and eager to contribute to work. Creative thinker with good analytical and problem-solving skills. Good team player.
Nombre de places	2

Codi	NL NXP Ein_2
Data d'entrada	20/02/09
Tipus d'estada	PFC
Descripció	**Static Region Detection for Usage in a Frame-Rate Converson Application.** The internship consists of two parts. The first part is a literature research and evaluation of state-of-the art static region and overlay detectors. The second part is to develop an efficient implementation, keeping both memory and computational limitations into account. In most digital televisions, the video is converted to a higher frame rate using a frame-rate conversion algorithm. This algorithm is based on various approximations and can thus introduce artifacts in the output video. Artifacts around static regions, such as subtitles, are very noticeable and thus require special attention. In current systems a specific algorithm detects these static regions, so they can be handled correctly. Although the video processing IC's are becoming more powerful, both the video resolution and frame rate are also increasing. Therefore, the processing power per pixel is still limited. The

	algorithms are a trade-off between quality and cost. The current static region detection requires extensive tuning of its parameters. It is expected that the quality of the output can be improved.
Durada	The work will be conducted in a nine month period at the HTC The Netherlands. The start date is between March and June 2009.
Requisits	Signal processing, and video and image processing in particular.Desire to acquire new knowledge.Motivated and eager to contribute to work. Creative thinker with good analytical and problem-solving skills.Good team player.
Nombre de places	1

Codi	NL NXP Ein_3
Data d'entrada	23/02/09
Tipus d'estada	PFC
Descripció	**Video material frame rate detection for frame rate conversion in high-end TV sets.** Various frame rates are used to capture video material. During broadcast the original frames are repeated in order to align with the broadcast frame rate. Furthermore the broadcast is often in interlaced mode where even and odd lines are sent separately. Different frame repetition schemes are used for different video material. Broadcast standard in US is 60i and in Europe 50i which introduces further differentiation in repetition schemes. In order to be able to perform appropriate temporal conversion of the sequence, a high-end TV set needs to extract the frame rate of the original material. Detecting the repeated frames and the frequency is difficult because of the following reasons: noise in the analog broadcast, compression artifacts in the digital broadcast, hybrid material containing various frame rates etc. Goal: analyzing video features are appropriate for repeated frame detection and estimating the original frame rate. Setting up experiments and evaluating results.
Durada	6/9 months
Requisits	Programming skills (Matlab/C). Followed courses related to pattern recognition and image processing. Ready to explore and set-up own experiments.
Nombre de places	1

Codi	NL NXP Ein_4
Data d'entrada	23/02/09
Tipus d'estada	PFC
Descripció	**Real-time video Content-detection.** *Aim:* Real-time content detection for Sky, Grass & Skin areas in TV video. *Approach:* Start from existing research algorithm, explore and optimize the algorithm, and design efficient implementation in a DSP. *Minimal goal:* Optimized algorithm and optimized reference SW implementation for the detectors. Working demo of a areal-time implementation of the detectors on a Trimedia DSP. *Maximum goal:* Real-time implementation of corresponding content-adaptive enhancement.
Durada	9 months
Requisits	Interest and affinity in algorithmic design. Programming skills (DSP programming is an advantage). Ready to explore and set-up own experiments.
Nombre de places	1

Codi	NL NXP Ein_5
Data d'entrada	23/02/09
Tipus d'estada	PFC
Descripció	**Subtitle/Logo detection and application in FRC.** *Aim:* Improve picture quality in frame-rate up-conversion, around subtitles/logos. *Approach:* Design an algorithm for accurate and robust detection of subtitles/logos. Design methodology for integration with FRC framework. *Minimal goal:* Accurate and stable subtitle segmentation. Real-time implementation in Trimedia DSP. Integration result with FRC software. *Maximum goal:* Real-time execution of the integrated solution (subtitle detection + adaptive FRC) in DSP.
Durada	9 months
Requisits	Interest and affinity in algorithmic design. Programming skills (DSP programming is an advantage). Ready to explore and set-up own experiments.
Nombre de places	1

Codi	NL NXP Ein_6
Data d'entrada	23/02/09
Tipus d'estada	PFC
Descripció	**Intelligent green TV backlight.** *Aim: Save power by switch off the TV backlight when nobody is there to watch!* *Approach: Accurately detect & track human presence near the TV.* *Minimal goal: Working demo of a display with smart controlled backlight. Detect & track person under controlled lighting conditions.* *Maximum goal: Same, but robust for any lighting condition. 'Recognize': make distinction between type of presence: adults, kids, pets, whatever.*
Durada	9 months
Requisits	Student with hands-on, programming skills. Good mathematical skills. Ready to explore and set-up own experiments.
Nombre de places	1

Codi	NL NXP Ein_7
Data d'entrada	23/02/09
Tipus d'estada	PFC
Descripció	**Analysis, enhancement of car-mounted camera feeds.** *Aim:* Highlight useful information on automotive camera feeds, e.g. parking- or forward cameras. *Approach:* Analyze depth and motion for detecting vehicles & objects. Enhance visibility of distance, location, movement. *Minimal goal:* Apply simple depth analysis (given technology), tuned to calibrated camera view. Hightlight depth as colour, make image more intuitive. Emphasize fast approaching & near objects (e.g. by colorizing). *Maximum goal:* Advanced depth analysis: exploiting all scene knowledge e.g. detecting/segment vehicles. Highlight common objects (road, lane markings). Performing accurate collision detection.
Durada	9 months
Requisits	Student with hands-on, programming skills. Good mathematical skills. Ready to explore and set-up own experiments in a car.
Nombre de places	1

Codi	NL NXP Ein_8
Data d'entrada	23/02/09
Tipus d'estada	PFC
Descripció	**Ouput driven rendering for parallel implementations.** *Aim:* Develop output driven 3DTV rendering algorithm with high picture quality. *Approach:* Use depth as motion field and apply frame rate upconversion principles. *Minimal goal:* Algorithm with comparable picture quality as input driven. *Maximum goal:* Real-time implementation of proposed algorithm on NXP's DSP platform.
Durada	9 months
Requisits	Good mathematical skills. Affinity with video processing. Student with hands-on, programming skills. Flexible to also program for embedded programmable processors like TriMedia.
Nombre de places	1

Codi	NL NXP Ein_9
Data d'entrada	23/02/09
Tipus d'estada	PFC
Descripció	**High quality stereo-to-stereo data format conversion.** Aim: Develop algorithm for stereo-to-stereo data format conversion better than just scaling. *Approach:* Use information present in the other picture. *Minimal goal:* Algorithm with better picture quality compared to just scaling. *Maximum goal:* Real-time implementation of proposed algorithm on NXP's DSP platform.
Durada	9 months

Requisits	Good mathematical skills. Affinity with video processing. Student with hands-on, programming skills. Flexible to also program for embedded programmable processors like TriMedia.
Nombre de places	1

EPFL

EPFL - Lausanne (Switzerland)

Codi	CH EPFL Lan_1
Data d'entrada	17/02/09
Tipus d'estada	PFC
Descripció	**Bio-inspired Egomotion Estimation.** A moving visual system generates a characteristic pattern of image motion on its sensors. These image-shifts, known as optical flow fields, can be described as vector fields where each vector indicates the direction and velocity of the local image-shift. Recent studies show that tangential neurons in the fly brain are sensitive to the typical optic flow patterns generated during self motion, suggesting that each tangential neuron extracts a specific motion component from the optic flow that may be useful for gaze stabilization and flight steering. Taking inspiration from that, in this project we aim to estimate the rigid motion of a moving camera, i.e. the egomotion, interpreting this task as a pattern recognition problem: given a few typical motion patterns generated, for example, from pure translation or rotation, we will deduce the motion between two frames of a video sequence performing classification of the estimated optical flow field.
Durada	6/9 months
Requisits	Matlab or C++, notions of computer vision.
Nombre de places	1

Codi	CH EPFL Lan_2
Data d'entrada	17/02/09
Tipus d'estada	PFC
Descripció	**Multi-commodity network coding.** Network coding techniques have been proposed as an efficient method for improving the resiliency of the transmission process as well as the network throughput. Network coding is also very interesting for multimedia streaming in overlay networks where there is no guaranteed quality of service due to packet erasures and bandwidth variations. However, network coding is still far from being applied for real multimedia streaming as many problems should be addressed. In this project we would like to investigate the development of novel network coding techniques for more realistic streaming scenarios where various video streams share the network utilities. For such scenarios, special techniques will be developed for distinguishing the various streams which have been mixed through network coding. Timing constraints and the importance of the video streams will be taken into account for improving the quality of the displayed videos at network clients.
Durada	6/9 months
Requisits	C or Matlab programming, basic knowledge of computer networks and optimization theory
Nombre de places	1

Codi	CH EPFL Lan_3
Data d'entrada	17/02/09
Tipus d'estada	PFC
Descripció	**Bits error combating network coding techniques.** Network coding based video streaming have recently attracted much attention of the research community. These methods are interesting for self-organizing networks where network users share the network resources. Most of the network coding techniques consider only packet erasures; however, this is not realistic for wireless transmission scenarios where bit errors occur due to signal attenuation and interference between various sources sharing the network. Bit errors may lead to significant quality degradation as video streams are very sensitive. The aim of this project is the design of network coding techniques that are appropriate for video streaming scenarios and combat bit errors and packet losses. The application of advanced channel coding methods will be considered.
Durada	6/9 months
Requisits	C or Matlab programming, basic knowledge of computer networks and optimization theory
Nombre de places	1

Other proposals are available on: http://lts4www.epfl.ch/sprojects.php

Philips Technologie GmbH Forschungslaboratorien

Philips Technologie GmbH Forschungslaboratorien – Aachen (Germany)

Codi	D PHILIPS Aac_1
Data d'entrada	17/02/09
Tipus d'estada	PFC
Descripció	**Capacitor Charging Circuit.** A range of switch-mode power supply topologies (flyback, forward, resonant) has been proposed and is being used to charge capacitors in pulse power applications like e.g. defibrillators and flash lamps that are applied for photography, pumping solid-state lasers, and in medical devices. These capacitor charging circuits must have a high efficiency and high power density in order to achieve a high repetition rate in a small volume and weight. Subject of this diploma thesis will be to study alternative switch-mode topology capacitor charging circuits. This includes comparison of a range of topologies based on their theoretical description and Spice simulations, and the building of a prototype for the most promising topology and to tune the efficiency of this.
Durada	6 months. Starting date: as soon as possible.
Requisits	Basic practical and theoretical knowledge in power electronics. Familiar with a circuit simulation tool like LTSpice. Practical skills to measure and to set up circuits. High motivation and good English skills.
Nombre de places	1

Nokia Siemens

Nokia Siemens Networks - Aalborg (Denmark)

Codi	DK NSN Aal_1
Data d'entrada	19/02/09
Tipus d'estada	PFC
Descripció	**Inter-Cell Interference Coordination Schemes for Local Area Deployments.** LTE-Advanced should support peak data rates of 1 Gbps and 500 Mbps with spectral efficiencies of 10 and 5 bps/Hz in the Downlink (DL) and Uplink (UL), respectively. Low power home base stations, called here HeNBs, provide users a cheap and convenient access to high data rates. Hence, it is anticipated that HeNBs will become increasingly popular in the near future. However, similarly to existing Wireless Local Area Networks (WLANs), chaotic unplanned deployments in residential areas and settings supporting flash crowds are likely to become the norm rather than an exception. Assuming uncoordinated deployments, i.e. without prior network planning, the interference conditions will be significantly different from those observed in standard macro cell networks with planned and optimized site locations. If left unchecked, heavy inter-cell interference will arise, leading to very poor system performance, especially for cell-edge users. This project intends to investigate simple yet robust inter-cell interference coordination schemes for scenarios with uncoordinated deployment of HeNBs. The main focus is on distributed time-domain and contention based concepts assisted by long-term interference coupling statistics generated as a by-product of system operation, i.e. the system should be capable of learning.
Durada	8 months. Starting date: Mid-August – September, 2009.
Requisits	Programming skills is mandatory; Matlab and/or C++ preferred. Basic knowledge about Radio Resource Management algorithms and system level simulations is desired.
Nombre de places	1 or 2

Codi	DK NSN Aal_2
Data d'entrada	19/02/09
Tipus d'estada	PFC
Descripció	**Study on a Cognitive Network Manager with self-organizing and cooperative network optimization capabilities in a Wireless Meshed LAN scenario.** The project is intended to study a new network management approach based on cognitive, evolutionary, game theoretic and bio/evolutionary-inspired algorithms. Cognitive network manager will act at L2 of the ISO-OSI stack for a fast and efficient network management. It will ensure a complete and distributed self-organization of the entire network, enabling a complete "plug & play" functionality for the final users. Recent advances in cognitive and distributed network planning and management will be used as a starting point for the investigation. A Matlab simulator will be developed in order to proof the efficiency of the identified solution.
Durada	8 months. Starting date: Mid-August – September, 2009.

Requisits	Students should provide a proved background on wireless communications, lower level networking aspects (L2 ISO-OSI stack), upper level networking aspects (L3/L4 ISO-OSI stack; appreciated but not necessary), Matlab programming skills.
Nombre de places	1 or 2

Codi	DK NSN Aal_3
Data d'entrada	19/02/09
Tipus d'estada	PFC
Descripció	**Study on a Cognitive Radio-based PHY layer and Radio Environment Sensing Mechanisms for Wireless Mesh Lan Access.** The project is intended to study a new approach for wireless access in LAN scenarios. A new PHY layer will be designed based on adaptive OFDMA multiple access scheme. Study will involve aspects from the signal waveform generation to PHY frame format and TDD/FDD multiple access schemes. A Radio Resources Manager will drive the new layer for an improved optimization of the available spectrum/energy resources always keeping into account the QoS needs of users. Furthermore, the new PHY layer shall grant a full support to mesh and device-to-device functionalities that the new and emergent system should ensure. All these aspects will be faced within the new concept of Cognitive Radio, where cognitive, evolutionary, game theoretic and bio-inspired algorithms will help in solving the faced problems. A Matlab simulator will be implemented in order to proof the efficiency of the identified PHY solution.
Durada	8 months. Starting date: Mid-August – September, 2009.
Requisits	Students should provide a proved background on digital communications, wireless communications, signal processing (appreciated but not strictly necessary), Matlab programming skills.
Nombre de places	1 or 2

Codi	DK NSN Aal_4
Data d'entrada	19/02/09
Tipus d'estada	PFC
Descripció	**Performance of Relay Enhanced LTE Networks.** Coverage extension in a cellular network can be realized by using relay nodes, which are basically "low-cost/low-power/simplified" base stations that can be used to relay data to and from mobile terminals that do not have good radio links to their serving base stations. Apart from this main goal of coverage extension, introducing relaying can also help in the provision of high-bit-rate coverage in high shadowing environments; reducing average radio-transmission power (and hence battery consumption) at mobile terminals, enhancing cell capacity and effective throughput, balancing cell load and enhancing overall performance and deployment cost of a radio access network. Relaying is a study item in the LTE-Advanced and it is expected to be an integral part of future LTE standards. This project will be focused in carrying out performance studies of relay enhanced LTE networks that encompass some topics within handover, resource partitioning between directly connected terminals and relayed terminals, distributed radio resource management, power control and ARQ. A simulator, based on either Matlab or C/C++, will be built to demonstrate the performance enhancement due to relaying and also test out novel concepts in this emerging distributed mobile network architecture.
Durada	8 months. Starting date: Mid-August – September, 2009.
Requisits	Students should provide a proved background on digital communications, wireless communications, signal processing (appreciated but not strictly necessary), Network protocol stacks, Matlab/C programming skills.
Nombre de places	1 or 2

NEC

NEC, Network Laboratories – Heidelberg (Germany)

Codi	D NEC Hei_1
Data d'entrada	19/02/09
Tipus d'estada	PFC
Descripció	**Wimax** The IEEE 802.16 technology (WiMAX) is a promising alternative to 3G or wireless LAN for providing last-mile connectivity by radio link due to its large coverage area, low cost of deployment and high speed data rates. However, in order to compete with already well-established wireless technologies, WiMAX has to show that it outperforms legacy wireless technologies significantly. The student will get involved in a project which contributes to the development of NEC's WiMAX products. The main goals of the Project are the design and evaluation of proprietary algorithms and research on future technology enhancements.
Durada	6/9 months.

Requisits	Analytical skills. Fluent English. Previous experience with network simulators and/or knowledge of the 802.16 technology will be valued. C/C++/Matlab coding knowledge.
Nombre de places	1

Codi	D NEC Hei_2
Data d'entrada	19/02/09
Tipus d'estada	PFC
Descripció	**3G/WiFi Mobile Phones Project** 3G mobile terminals are including Wireless LAN capabilities due to its popularity and the success of this technology in offering high data rates at a low cost. Currently there are two main IEEE specifications considered for future 3G/WiFi mobile phones, 802.11e and 802.11n, which define mechanisms to improve the Quality of Service, bandwidth capacity and power saving of the current WiFi chipsets. However, the proper configuration of these mechanisms as well as the design of some of the algorithms that are left open to implementors is required for delivering the desired services. The student will get involved in a project which pursues to design and configure proprietary algorithms for product differentiation of NEC's 3G/WiFi phones. The project will be performed in the framework of the development of the next generation of NEC's 3G/WiFi mobile phone N906iL.
Durada	6/9 months.
Requisits	Analytical skills. Fluent English. Previous experience with network simulators and/or knowledge of the 802.11 technology will be valued. C/C++/Matlab coding knowledge.
Nombre de places	1

Codi	D NEC Hei_3
Data d'entrada	19/02/09
Tipus d'estada	PFC
Descripció	**Future Internet Projects** For several Future Internet projects we seek students in the area of Networking Research. Several positions are available including thesis topics in Network Virtualization, Data-centric networking, Self-management of the Future Internet, Less-than-best effort transport protocols. Details to be discussed with applicants.
Durada	8 months. Starting date: July 2009.
Requisits	Some programming and/or simulation tools skills.
Nombre de places	3

Ericsson GmbH

Ericsson GmbH – Herzogenrath (Germany)

Codi	D ERICSSON Her_1
Data d'entrada	19/02/09
Tipus d'estada	PFC
Descripció	**Mobile Push Delivery of Multimedia Content.** Delivery of content via push mechanisms in mobile networks is nowadays almost only used for mobile email access. However existing standards and new published APIs, provide for developers increased possibilities to develop many more attractive push applications. The student will implement during his stay a generic and advanced J2ME based application that will show on a prototype the broad range of multimedia applications in combinations with push mechanisms.
Durada	Flexible, between 6 to 9 months. Starting date: July or August 2009.
Requisits	Knowledge about multimedia and multimedia communications necessary. Basic knowledge about cellular communication networks preferred. Programming experience e.g. Java, J2ME, python
Nombre de places	1

Codi	D ERICSSON Her_2
Data d'entrada	19/02/09
Tipus d'estada	PFC

Descripció	**Mobile interactive 3D video.** Whereas transferring 2D video to mobile phones is common today, next step is the application of interactive 3D video to mobile phones. Here, a user navigates interactively within the 3D scene by changing his point of view. The viewpoint is selected using suitable user interfaces e.g. using acceleration sensors of the mobile phone. The master thesis projects willsupport the realization of a end2end mobile interactive 3D video system. This includes work on different components of such a system like transport of 3D video, synthesis and rendering of intermediate 3D video views and view selection using the mobile phone as input device.
Durada	Flexible, between 6 to 9 months. Starting date: July or August 2009.
Requisits	Knowledge about multimedia and multimedia communications necessary. Knowledge about 3D desirable but not a must. Programming experience e.g. C,C++, Java.
Nombre de places	2

BERTRANDT

Bertrandt AG – Ingolstadt, Munich (Germany)

Codi	D BERTRANDT AG Mun_1
Data d'entrada	19/02/09
Tipus d'estada	PFC
Descripció	**Elaboración y programación de un sistema automatizado de testeo de centralitas electrónicas de puerta para vehículos SEAT.** El lugar de realización del proyecto será en la sucursal que Bertrandt tiene en la localidad cercana a Ingolstadt provincia de Munich. Este proyecto, que se realiza en colaboración con SEAT, está dividido en 3 fases: *Formación:* 1 mes. En esta fase el estudiante adquiere todos los conocimientos necesarios para la realización del proyecto dentro de un equipo de trabajo y con un *tutor* expresamente designado responsable para acompañar al estudiante tanto a nivel técnico como personal. *Fase 1:* 3 meses. El objetivo de esta fase es la conexión de las centralitas de puertas con el Bus de Comunicaciones del vehículo (CAN), con los sensores y actuadores y con el HW del sistema de testeo. *Fase 2:* 3 meses. Esta segunda fase consta de la puesta en marcha del Bus de Comunicaciones del vehículo (CANoe), del sistema de medición de señales (LabView) y del medidor de tensiones (Wago). Este proyecto es una buena oportunidad para entrar en el sector de la automoción a través de una formación en Alemania de primer nivel que le aportará un Know-How muy valioso para asegurar grandes posibilidades de continuidad en el mismo proyecto con un contrato laboral.
Durada	7 meses. Inicio el 1 de septiembre de 2009.
Requisits	Se requiere un estudiante en últimos cursos de Ingeniería con especialidad en Electrónica o Telecomunicaciones, con inglés y/o alemán y con inquietud por el sector de la automoción.
Nombre de places	1

DLR

DLR Institute of Communications and Navigation – Oberpfaffenhofen, Munich (Germany)

Codi	D DLR Mun_1
Data d'entrada	20/02/09
Tipus d'estada	PFC
Descripció	**Analysisand Design of Non-Binary LDPC Codes for Satellite Communications.** Within this work, the performance of non-binary low-density parity-check codes shall be analyzed. Low-density parity-check codes represent a class of error correcting codes with near-Shannon limit performance. Their utilization in the satellite communications framework has been always limited to their binary construction, while non-binary constructions (able to provide further coding gains) have been neglected until now. The performance analysis and the design shall be performed by either analytical or software tools. The results are of interest for both space exploration and multimedia broadcasting applications.

Durada	6 months.
Requisits	Background knowledge of radio communications systems and communications networks. Excellent mathematical skills. Matlab/C/C++ programming. Background knowledge of satellite communications desired. Fluency in English.
Nombre de places	1

Codi	D DLR Mun_2
Data d'entrada	20/02/09
Tipus d'estada	PFC
Descripció	**Application Layer coding for robust data communications over unreliable space networks.** Within this work, it shall be investigated how high performance of data communication over space networks can be achieved through proper tuning of application layer protocols and packet-layer coding schemes. In more detail, the large propagation delays and the information error patterns exhibited in such networks make the use of feedback-based transmission protocols ineffective. Hence, the use of "FEC" applied at the higher layer may help improve the performance and the reliability of data communication. To this end, this work is aimed at exploring the performance improvement achieved in this way, by integrating packet-layer coding schemes into an application layer protocol. Finally, adequate tuning of the involved protocol parameters will be evaluated as well.
Durada	6 months.
Requisits	Background knowledge of radio communications systems and communications networks. Background knowledge of satellite communications desired. Fluency in English. Background knowledge of TCP/IP protocols and API Socket programming.
Nombre de places	1

Codi	D DLR Mun_3
Data d'entrada	20/02/09
Tipus d'estada	PFC
Descripció	**Forward Error Correction for Mobile Satellite Fading Channels.** The scope of this activity is to investigate analytical models to predict the performance of packet-level error correcting codes in a mobile satellite communication system. In a first stage, the candidate shall develop basic tools implementing typical mobile channels, comparing the statistical properties of the produced samples with the theoretical ones. The packet loss process shall be then modelled. The developed models shall be then used to derive the error rate performance of packet-loss recovery codes. The obtained results will be of interest for the development of fading countermeasures in the context of satellite-to-mobile multimedia broadcasting services.
Durada	6 months.
Requisits	Background knowledge of radio communications systems and communications Networks. Excellent mathematical skills. Matlab/C/C++ programming. Background knowledge of satellite communications desired. Fluency in English.
Nombre de places	1

Codi	D DLR Mun_4
Data d'entrada	20/02/09
Tipus d'estada	PFC
Descripció	**Header Compression Methods for Satellite Communications.** In the last years, protocol header compression methods for wireless communications have been developed to efficiently use the spectrum resources. Especially in the frame of 3GPP, the use of ROHC (RObust Header Compression) method has been developed and standardised with the aim at reducing the protocol overhead that is transmitted over the air. The ROHC is becoming the de-facto header compression standard in wireless networks. Nevertheless, its performance in the special case of satellite communications has not been deeply investigated, although the use of an efficient header compression method is of high interest to achieve cost-effective use of the scarce spectrum resources in satellite links. Within this work, it shall be investigated how the satellite air interface can impact the performance of ROHC in general, and in particular for the case of DVB-S2/RCS standards. Furthermore, the ROHC parameters shall be optimized for the use over such satellite standard, for unicast and broadcast/multicast communications, being the latter not supported by the ROHC standard as it is defined.
Durada	6 months.
Requisits	Background knowledge of radio communications systems and communications networks. Background knowledge on TCP/IP protocol suite. Background knowledge of satellite communications desired. Background knowledge on satellite communication standard DVB-S2/RCS desired. Programming skills: C++, Matlab. Fluency in English.
Nombre de places	1

Codi	D DLR Mun_5

Data d'entrada	20/02/09
Tipus d'estada	PFC
Descripció	**In-line Fine Pointing Assembly for optical Free-space Communication.** For beam-pointing and -tracking in high-speed free-space optical communications systems a precise opto-mechanical assembly (Fine Pointing Assembly, FPA) is required for optimum system performance. This system compensates terminal vibrations and other high frequency base motion disturbances of a carrier (e.g. aircraft). Conventional mirror systems results in bulky design of the optical system. Within this work the optical design of an advanced "in-line" FPA should be investigated and simulated. A possible second step is the construction and test of an optical demo system.
Durada	6 months.
Requisits	Background knowledge of optical multi-lens system design. Advantageous: knowledge of software for optical system design (ZEMAX).
Nombre de places	1

Codi	D DLR Mun_6
Data d'entrada	26/02/09
Tipus d'estada	PFC
Descripció	**Development of a demonstrator for packet-level coding.** In order to guarantee reliable communications the transmitted data is often protected by adding redundancy. So-called channel coding can be applied on different OSI layers, to ensure high quality of service. Besides protection on physical layer, packet level coding is getting more and more interesting due to the high flexibility it offers. Within this work, a demonstrator for packet-level coding in the framework of DVB-SH shall be set up. It includes the transmission of a coded video stream over a tuneable erasure channel and the visual presentation of the received video. Since the encoder and decoder are already in place the main focus shall lie on their integration in a proper protocol stack. Moreover, different types of channels shall be realized in order to simulate real fading events.
Durada	6 months. Starting Date: As soon as possible
Requisits	Good c/c++ programming skills. Knowledge on protocols desired (RTP/IP/TCP). Fluency in English. Background knowledge of radio communications systems and communications networks helpful.
Nombre de places	1

Philips Research Europe

Philips Research Europe – Eindhoven. The Netherlands.

Codi	NL PHILIPS Ein_1
Data d'entrada	23/02/09
Tipus d'estada	PFC
Descripció	**Ad hoc networking in a medical environment.** Several "ad hoc" networking techniques for WiFi equipment are available or are reaching maturity. Among these are Tunneled Direct Link Set Up (11z) , peer2peer (or soft AP), mesh networking (11s), and the good old ad hoc mode (or IBSS). A comparison of the strength and weaknesses of the various standards is needed including various viewpoints: Functionality; Hardware requirements; Availability of platforms. Based on this comparison, a decision must be reached on the suitability of these techniques for a given medical usage scenario for which detailed requirements are available. Depending on the length of the stay, the student could use an open source implementation of one of the techniques to investigate the quality of the ad hoc link in the presence of other WiFi equipment.
Durada	6 / 9 months.
Requisits	Good English working knowledge, computer science; Linux kernel knowledge, MAC 802.11; wireless knowledge.
Nombre de places	1

TriaGnoSys GmbH – Wessling

TriaGnoSys GmbH – Wessling. Oberpfaffenhofen. Germany.

Codi	D TriaGnoSys Wess_1
Data d'entrada	23/02/09

Tipus d'estada	PFC
Descripció	**Wireless Sensor Networks on-board Aircraft.** For operations and maintenance of future commercial aircraft, there is a significant potential for efficiency increase and cost reduction by using on-board Wireless Sensor Networks (WSNs). Replacing current wireline infrastructure, but also entering new areas of sensors for all kind of data collection, on-board WSNs ideally integrate sensing/data colection, networking/routing and data (pre-)processing capabilities. All prior work on WSNs in general is to be considered and assessed in the concrete scenario and the specific limitations encountered on board of aircraft. Potential work areas for self-contained diploma theses, however complementary to each other and integrated into a larger R&D project which provides scenarios, use cases, requirements and limitations, are as follows: • Specification, design, coding, simulation of on-board WSN, with focus on multiple access and network-layer (routing) protocols; • Coding/implementation of a proof-of-concept laboratory test-bed WSN using microprocessor evaluation boards. For each single work/diploma thesis, the following two steps are the natural first and last tasks, respectively: • with support of supervisor/team, mostly self-organized training, background reading and literature survey capturing the state-of-the-art; • write a self-contained scientific report (diploma thesis), comprehensively summarizing the work performed.
Durada	6 months. Preferred starting date is between July and October 2009.
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. Depending on the particular direction, basic to advanced knowledge in Matlab and/or C/C++, discrete-event simulation, microprocessors is strongly recommended. Knowledge of LaTeX is welcome, as well as prior studies or thematic knowledge about WSNs or ad-hoc networks. 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

Codi	D TriaGnoSys Wess_2
Data d'entrada	23/02/09
Tipus d'estada	PFC
Descripció	**Mobile Satellite Antenna Tracking Control System.** In the last few years an increasing interest has been addressed to the many satellite services at Ku-band being proposed or already operative, ranging from digital radio and TV broadcast to broadband internet services. Potential applications and markets especially regard mobile environments (cars, trains, boats, airplanes). The success of new services and the expansion of those already present depends to a great extent on the user terminal cost and performance. Since most of the applications refer to mass consumer markets, the first driving factor for the antenna design and development is the fabrication cost, that must be maintained as low as possible. One important cost driver is the antenna tracking control system which has the task to continuously steer the antenna towards the desired satellite, compensating the movements of the mobile platform the antenna is mounted on. In order to fulfil this task, the antenna tracking system may make use of attitude sensors (e.g. MEMS sensor) and a heading reference (e.g. GPS, magnetic compass) or the received satellite signal or both. The target is to design a tracking system that achieves sufficient performance at the lowest cost possible. The main objectives and tasks are organised in two phases: Phase 1: Algorithm Analysis and Down-Selection • Detailed design of an open-loop pointing, acquisition and tracking (PAT) algorithm (relying on attitude/heading sensors), including: o Specification of the interface between the pointing algorithm and the antenna controller; o Detailed specification of the algorithm for best PAT accuracy, maximising the satellite receive power; o Potential improvement through using satellite receive signal quality feed-back (addition of a closed-loop component); o MATLAB/SIMULINK implementation, verification and performance assessment of the algorithm options, and down-selection of suitable candidate for functional and low-cost hardware implementation; o Specification and MATLAB implementation of the algorithm antenna control. Phase 2: Tracking Control System and Algorithm Implementation • Implementation of the down-selected algorithm on proper PAT processing platform (micro-controller or alternatively FPGA). • Hardware implementation of a simplified but fully functional low-cost PAT system, including sensors, PAT processing unit, and all signal interfaces. • Implementation of antenna control system with direct interfaces to antenna.
Durada	6 months. Preferred starting date in July 2009.

Requisits	The thesis is to be written in English. For phase 1, basic to advanced knowledge in Matlab/Simulink is strongly recommended. Basic knowledge in Kalman-Filter-Theory is advantageous. For phase 2, basic to advanced knowledge in microcontroller and/or FPGA programming is strongly recommended. 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.

Codi	D TriaGnoSys Wess_3
Data d'entrada	23/02/09
Tipus d'estada	PFC
Descripció	**Development of Future Air Traffic Management (ATM) Network Test-Bed** The concrete work to be performed will be in the direction of continuing the development and integration of the test-bed, which will be used also potentially for another upcoming EU project. This includes one of the following areas (not preventing adaptations and flexible reaction to lessons learnt while performing the work): • integration of future communication technologies into the test bed, namely WiMAX, Land Ku-band satellite modem; • study and implementation of security and quality of service (QoS) mechanisms for future ATM services; For each single work/diploma thesis, the following two steps are the natural first and last tasks, respectively: • with support of supervisor/team, mostly self-organized training, background reading and literature survey capturing the state-of-the-art; • write a self-contained scientific report (diploma thesis), comprehensively summarizing the work performed.
Durada	6 months. The preferred starting date is between July and October 2009.
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. Basic to advanced knowledge in Matlab, C/C++, and Linux IP(v6) networking is strongly recommended. Knowledge of LaTeX is welcome. 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 pel que fa a aquests 3 projectes: 1-2

Thales Nederland

Thales Nederland – Huizen, The Netherlands

Codi	NL THALES Hui_1
Data d'entrada	09/03/09
Tipus d'estada	PFC
Descripció	**Routing over Radio Networks using Disruptive Tolerant Networking** Networks in the field are unreliable and often broken. Routing needs to be made smart enough to accept this constantly changing environment and provide the most optimized paths.
Durada	6 /10 months; Starting date: Sept-2009 or later
Requisits	You will be responsible for the definition (project plan and architecture), implementation (SW and HW) and demonstration of your project (PFC). Technically, you shall have solid basic knowledge of networking technologies (IP, TCP/UDP, Ethernet, Wi-Fi, ATM, DNS, DHCP, ...). Strong software skills (specifically, C or C++ or Java) needed, as implementation is a MUST. You should also be familiar with the Linux operating system. Other concepts you should may be familiar with are application protocols, such as VoIP (SIP, i.e.) and streaming (RTSP, i.e.). You will be working autonomously, with support, mentoring and guidance from senior engineers. They will help to grasp the complexity of our product line and the deployment scenarios. Communication with all levels (from product managers to software engineers) will be needed. Fluent in English, spoken and written. A phone interview will be scheduled (for communication and technical assessment).

Codi	NL THALES Hui_2
Data d'entrada	09/03/09

Tipus d'estada	PFC

Descripció	**Multiple Audio Channels on one physical radio (multiplexed)** Audio (digital) is a very specific type of data, whose specificity can be used to improve and increase the number of available channels on one single radio frequency.

Durada	6 /10 months; Starting date: Sept-2009 or later

Requisits	You will be responsible for the definition (project plan and architecture), implementation (SW and HW) and demonstration of your project (PFC). Technically, you shall have solid basic knowledge of networking technologies (IP, TCP/UDP, Ethernet, Wi-Fi, ATM, DNS, DHCP, ...). Strong software skills (specifically, C or C++ or Java) needed, as implementation is a MUST. You should also be familiar with the Linux operating system. Other concepts you should may be familiar with are application protocols, such as VoIP (SIP, i.e.) and streaming (RTSP, i.e.). You will be working autonomously, with support, mentoring and guidance from senior engineers. They will help to grasp the complexity of our product line and the deployment scenarios. Communication with all levels (from product managers to software engineers) will be needed. Fluent in English, spoken and written. A phone interview will be scheduled (for communication and technical assessment).

Codi	NL THALES Hui_3
Data d'entrada	09/03/09
Tipus d'estada	PFC

Descripció	**Optimized TCP/IP over military low datarate links (HF)** Multiple NATO (and other organization) standards exists to allow for data radio to interoperate. Here we want a study, selection, implementation and interop test of at least one of the available protocols.

Durada	6 /10 months; Starting date: Sept-2009 or later

Requisits	You will be responsible for the definition (project plan and architecture), implementation (SW and HW) and demonstration of your project (PFC). Technically, you shall have solid basic knowledge of networking technologies (IP, TCP/UDP, Ethernet, Wi-Fi, ATM, DNS, DHCP, ...). Strong software skills (specifically, C or C++ or Java) needed, as implementation is a MUST. You should also be familiar with the Linux operating system. Other concepts you should may be familiar with are application protocols, such as VoIP (SIP, i.e.) and streaming (RTSP, i.e.). You will be working autonomously, with support, mentoring and guidance from senior engineers. They will help to grasp the complexity of our product line and the deployment scenarios. Communication with all levels (from product managers to software engineers) will be needed. Fluent in English, spoken and written. A phone interview will be scheduled (for communication and technical assessment).

Nombre de places pel que fa a aquests 3 projectes: 1 (a triar un dels tres).