PFC a Empreses (Tardor 2013-14)

Empreses on pots fer el PFC

Empreses i Institucions que ofereixen projectes a l'ETSETB i que gestiona l'escola
Última actualització: 25 de febrer de 2013

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.

Bell Laboratories

Philips Research Europe

TriaGnoSys GmbH

Pixable

M*Modal

Nokia Siemens

CERN

DLR – German Aerospace Centre, Institute of Communications and Navigation

Alcatel-Lucent

Bell Laboratories

Bell Laboratories (Alcatel●Lucent). NJ, USA. Professor de contacte: Joan M. Gené Bernaus

Codi	USA Alcatel_1
Estudis	Pla 92 i Graus
Data d'entrada	04.02.13
Tipus d'estada	PFC
Descripció	**High Capacity Fiber-Optic Transmission Systems** Bell Labs has helped weave the technological fabric of modern society. Since its founding in 1925, technology from Bell Labs has shaped the ways people live, work and play. Over the past 80 years, the Bell Labs R&D community has made seminal scientific discoveries, created powerful new technologies, and built the world's most advanced and reliable networks. Here are some Bell Labs innovations that changed the world: The Transistor (1947), Shannon's Information Theory (1948), Laser (1958), Communications Satellites (1962), The CCD (1969), Unix Operating System and C Language (1969-1972), Digital Signal Processor (DSP) (1979), Optical WDM systems and networks (1990), First 100G Ethernet transmission (2005). Project: Fiber-optic communications are evolving from simple intensity modulation with direct detection systems towards sophisticated multilevel modulation with coherent detection. Furthermore, digital signal processing techniques are also under development to overcome the main limitations given by transmission impairments. The scope of the project is to investigate on advanced modulation and detection schemes to exploit the huge capacity of an optical fiber. Some scientific references on the topic are: Peter J. Winzer, "Beyond 100G Ethernet", IEEE Communications Magazine, vol. 48, no. 7, pp. 26-30, July 2010. René-Jean Essiambre, Gerhard Kramer, Peter J. Winzer, Gerard J. Foschini, Bernhard Goebel, "Capacity Limits of Optical Fiber Networks", IEEE-OSA Journal of Lightwave Technology, vol. 28, no. 4, pp. 662-701, February 2010. Location: 791 Holmdel-Keyport Rd., Holmdel, NJ 07733, USA maps.google.com à 40.390736,-74.1866 70 Km from Manhattan (New York City) www.nycgo.com Public Transport www.njtransit.com Newark Int. Airport www.panynj.gov/airports/newark-liberty.html
Inici	September 2013 – February 2014 (flexible)
Durada	6-9 months
Nombre de places	1
Requisits	Excellent academic records, good English knowledge, fiber-optic communications, digital communications, signal processing, laboratory skills, Matlab simulation.
Compensacions	A compensation will be given (subject to student's performance)

Philips Research Europe

Philips Research Europe – Eindhoven. The Netherlands. Professor de contacte: Eduard Alarcón

Codi	NL PhilipsEin_1	
Estudis	Pla 92 i Graus	
Data d'entrada	08.02.13	
Tipus d'estada	PFC	
Descripció	**Advanced LED Drivers** The Philips Research Solid State Lighting group is searching for graduate and undergraduate students willing to contribute to the exciting solid state lighting revolution. The student/s will work in a high tech industry facility together with a professional research team of electrical engineers. The student/s will closely work with the research team to fundamentally analyze a number of novel converter topologies suitable for LED drivers. Context: Solid state lighting technologies are among the most prominent innovations influencing the way in which we improve our future by reducing energy consumption. So much so that the current 20% of the world's electricity consumed by lighting can potentially be reduced to 4% with the full-scale adoption of LEDs (Light-Emitting Diodes). LED electronics need to keep pace with the continuously increasing efficiency and miniaturization of LED engines.	
Inici	July 1 (or earlier).	
Durada	6 months; extension possible.	
Nombre de places	1	
Requisits	Good knowledge in power electronics, Good knowledge in circuit theory and circuit simulation tools, Practical skills to set up and measure circuits, High motivation, teamwork, good English (written and spoken).	
Compensacions	A compensation and housing allowance. will be given.	

Codi	NL PhilipsEin_2	
Estudis	Pla 92 i Graus	
Data d'entrada	08.02.13	
Tipus d'estada	PFC	
Descripció	**Computational Techniques for LED Optical Microcavities** The Philips Research Solid State Lighting group is searching for graduate and undergraduate students willing to contribute to the solid state lighting revolution. The student/s will work in a high tech industry facility together with a professional research team of electrical engineers and physicists. The proposed area of investigation deals with numerical methods and computational techniques to model the processes of light extraction in power LED (Light-Emitting Diodes) devices. We aim at the use of complex corrugated microstructures to boost the efficiency of our current LUXEON LED products (visit Lumileds website). A 3D optics model of thin film micro-structures ought to be developed, tested, and experimentally validated. The student will have the opportunity to closely work with a team working on advanced multiphysics LED models to guide us in the understanding of a number of exciting fundamental physical mechanisms. Context Solid state lighting technologies are among the most prominent innovations influencing the way in which we improve our future by reducing energy consumption. So much so that the current 20% of the world's electricity consumed by lighting can potentially be reduced to 4% with the full-scale adoption of LEDs.	
Inici	July 1 (or earlier)	
Durada	6 months; extension possible.	
Nombre de places	1	
Requisits	Good programming skills, Good mathematics skills, particularly, numerical methods for solving PDEs (frequency and time domain), Good knowledge of Maxwell's equations, LED device physics knowledge, High motivation and good English (written and spoken).	
Compensacions	A compensation and housing allowance will be given	

TriaGnoSys GmbH

TriaGnoSys GmbH, Wessling-Oberpfaffenhofen. Germany

Codi	D TrGnSys-Wess1	
Estudis	Pla 92 i Graus	
Data d'entrada	08.02.13	
Tipus d'estada	PFC	
Descripció	**Software Defined Radio Modem Development** In this thesis several off-the-shelf software-defined radio (SDR) implementation frameworks shall be investigated and compared. The concrete works to be performed include the following: Study and understand the process of implementing physical and link layer (L1/L2) in an SDR environment. Study and compare existing off-the-shelf SDR implementation frameworks according to selected criteria (cost, features,	

	development time, performance, etc.). Open source frameworks are preferred (e.g. GNURadio), but the possibility to use commercial tools and libraries (e.g. Matlab/Simulink-based) shall not be excluded, depending on the assessed benefit and cost. Develop and test a software modem using the building blocks provided by the selected framework, following a specific communication standard, either existing (e.g. message-based service over satellite, or DVB-S2/RCS) or future standards (e.g. for UAV command and control communications). 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.
Inici	The second or third quarter of 2013.
Durada	The thesis will have a duration of 5 to 6 months.
Nombre de places	1
Requisits	The candidate must have sufficient mastery of English to write a thesis and/or basic technical report. The candidate must have some basic knowledge and interest on radio/wireless communication techniques, in particular layer 1 (physical) and 2 (data link) of the OSI layered protocol model (keywords include modulation techniques, channel coding, random access protocol). The candidate must possess sufficient analytical and problem solving skills, and have the "get things done" attitude.
Compensations	A compensation will be given.

Codi	D TrGnSys-Wess2
Estudis	Pla 92 i Graus
Data d'entrada	08.02.13
Tipus d'estada	PFC
Descripció	**Design & implementation of software applications for a rapid-deployment unit for emergency communications** Background: TriaGnoSys currently participates in the European research project ABSOLUTE (Aerial Base Stations with Opportunistic Links for Unexpected and Temporary Events). This project will introduce a rapidly deployable UMTS and LTE network based on Low Altitude Platforms (LAPs) and Portable Land Units (PLUs) for the support of disaster-relief activities. In the ABSOLUTE network, voice and data traffic from victims and/or first respondents is routed through the PLU and backhauled over S-band satellite links to the PSTN, the Internet or to a remote emergency coordination centre. In this context, the PLU aggregates multiple interoperable communication systems steered by the PLU users. The current Thesis tackles the software functionalities offered by the PLU to its users, who interact with it through a touchscreen and multiple communication systems (i.e. UMTS, LTE, WLAN, a sensors network and a satellite link). Objectives: 1. To define software applications useful to the multiple actors (victims, first-responders, etc) in emergency scenarios. 2. To draft the UML design of the defined applications. 3. To implement the applications. 4. To document the development 5. To test the applications. Methodology: 1. Understanding of the basics of TriaGnoSys emergency communications suite. 2. Analysis of the user requirements & the PLU system requirements. 3. Market review of current applications for PLU-like systems. 4. Definition and UML design of the target applications. 5. Implementation. 6. Testing. 7. Documentation writing. Month 1: Literature review. Analysis. Market review. Design (mockup). Month 2: Implementation. Mid-term presentation. Month 3: Continued implementation. Debugging & Testing. Month 4: Writing up. Final presentation.
Inici	September 2013.
Durada	The thesis will have a duration of 6 months.

Nombre de places	1
Requisits	Software development with C++. Experience working on Linux environments. Knowledge in software modeling with UML. Knowledge of mobile communication systems such as UMTS, LTE and/or TETRA. Knowledge of wireless sensor networks. Knowledge of satellite communications. Knowledge/experience in impressive GUI design with HMTL5. Knowledge of web servers (e.g. Apache, …).
Compensacions	A compensation will be given.

Codi	D TrGnSys-Wess3
Estudis	Pla 92 i Graus
Data d'entrada	08.02.13
Tipus d'estada	PFC

Descripció	**Research & implementation of power consumption optimization solutions for a rapid deployment unit for emergency communications**
	
	Background
	
	TriaGnoSys currently participates in the European research project ABSOLUTE (Aerial Base Stations with Opportunistic Links for Unexpected and Temporary Events). This project will introduce a rapidly deployable UMTS and LTE network based on Low Altitude Platforms (LAPs) and Portable Land Units (PLUs) for the support of disaster-relief activities.
	In the ABSOLUTE network, voice and data traffic from victims and/or first respondents is routed through the PLU and backhauled over S-band satellite links to the PSTN, the Internet or to a remote emergency coordination centre. In this context, the PLU aggregates multiple interoperable communication systems steered by the PLU users. In order to maximize the operational time and self-sufficiency, this Thesis shall
	investigate techniques and approaches that reduce the power needs of the PLU.
	
	Objectives
	
	1. To research approaches that reduce the power consumption of the PLU such as:
	    Comparison of low-power computing platforms.
	    Batteries comparison.
	    Antenna elevation to increase coverage area.
	    Energy harvesting techniques.
	    Renewable sources.
	2. To implement the designed GUI.
	3. To document the work undertaken.
	
	Methodology
	
	1. Understanding the basics of TriaGnoSys emergency communications suite.
	2. Literature review on green and power-efficient cellular communication systems.
	3. Research on novel techniques for power optimization.
	4. Implementation of proposed techniques.
	5. Documentation writing.
	
	Month 1:
	
	Literature review.
	Proposal of techniques.
	
	Month 2:
	
	Implementation & Integration.
	Mid-term presentation.
	
	Month 3:
	
	Performance benchmarking.
	Optimization.
	
	Month 4:
	
	Writing up.
	Final presentation.

Inici	September 2013.
Durada	Minimum duration of 6 months.
Nombre de places	1
Requisits	Knowledge of power grids and electric energy consumption. Knowledge of cellular communication systems (e.g. GSM, UMTS, LTE, TETRA). Experience with numerical analysis tools (e.g. Matlab). Technical writing.
Compensacions	A compensation will be given.

Codi	D TrGnSys-Wess4
Estudis	Pla 92 i Graus
Data d'entrada	08.02.13
Tipus d'estada	PFC

Descripció	**TriaGoTV**
	
	Background
	
	License fees for current Wireless Inflight Entertainment (IFE) Solutions are inherently expensive making those systems unattractive for the competitive market of short-haul flights. High license fees are partially driven by a requirement for Digital Rights Management (DRM) and codec development.
	Digital Rights Management can be avoided for Wireless IFE Systems targeted at short range flights.
	Flight times on such routes are generally too short to watch latest Hollywood releases for which DRM is required. In-flight entertainment options on such short flights rather focus on up-to-date news, TV series episodes (typ. 22 minutes), short films and documentaries, which have less stringent requirements on content protection.
	Furthermore, costly development of proprietary streaming servers, codecs and client applications can be significantly reduced by using HTML5, DLNA (Digital Living Network Alliance) or others as wellestablished industry-standards for content distribution. Those methods are supported by a variety of servers and players natively or for which support can be added through readily available plugins and apps (e.g. smartphones). Some of these clients/servers support customization through skins allowing
	airline branding with reasonable effort, if required.
	
	TriaGoTV Key Features
	
	• Low-Cost IFE System
	• Video & Audio
	• Static & "pseudo-live" content (recent news)
	• Use of existing (open-source) transcoders and servers
	• Web (HTML5) & DLNA Support - allowing use of a wide range of readily available clients and apps (DLNA-enabled MP3 players, iOS, Android, Windows)
	• Web Player Interface
	• Live update of content (e.g. news)
	• Distribution to passengers over WiFi
	
	Ground Domain
	
	Content Collector: Constantly collects new content from local (disk) or online sources (e.g. news podcasts over internet). Also includes media conversion and compression if necessary.
	Content Manager & Repository: Maintains master repository of current content, including managing of time-sensitive content (i.e. delete outdated news etc).
	
	Transfer
	
	Transfer over terrestrial (3G/LTE) or satellite link.
	Rsync as transfer protocol as it uses delta encoding (minimizes transfer), compression and allows bandwidth throttling and shaping (more relevant for satellite links that are shared with other services).
	
	Aircraft Domain
	
	Content Repository: Replica of ground master repository.
	Portal Builder: Builds a (static) portal based on locally available content for use on aircraft. Local portal building is relevant as not all content might have been transferred onto the aircraft (e.g. when using terrestrial links that are only available while on the ground or after longer downtimes when there is a lot of content to be updated)
	Server: Web- and DLNA server for content distribution
	WiFi: In-cabin WiFi access point for content distribution to passengers
	
	Tasks
	
	Work Package 1 (Frontend/aircraft segment) ~4-6 months
	
	• Evaluate server software (such as OS-native HTML5 servers, MediaTomb, Plex etc) on aeroBTS hardware with regards to:
	
	    • Serving/Streaming capabilities
	    • Supported devices (including web streaming)
	    • Content management
	    • Branding (Skins)
	    • Number of simultaneous streams (load tests)
	
	• Specify and implement prototype portal builder
	
	    • Content organisation
	    • Optimise usability for desktop (laptop, iPads) and mobile devices (smartphones)
	    • Branding
	
	• Evaluate DLNA client software/apps (such as MediaHouse, Mobo, Plex, etc) on typical end user devices (Android/iOS smartphones and tablets) with regards to:
	
	    • Compatibility with server platforms
	    • Streaming capabilities
	    • Ease of use & handling
	    • Branding (Skins)
	
	• Integration into demo system
	
	• Documentation

Work Package 2 (Backend/ground segment) ~4 months

• Specify and implement prototype ground and aircraft content repositories

  • Organization of content
  • Synchronization using rsync
  • Prioritization of content
  • Management of time-sensitive content (purge algorithms)

• Specify and implement content collector

  • Ingest static content
  • Ingest online content (xml-based vod/podcasts) using selected online resources as proof-of-concept examples

• Integration into demo system

• Documentation

Demo System

• Support of video & audio content
• Web and DLNA streaming
• Content update mechanism
• Content collector, including pseudo-live content using Pod/Vodcasts (e.g. tagesschau.de)
• Branded portal (using TriaGnoSys logos, colour scheme)

Inici	September 2013.
Durada	The thesis will have a duration of 6 months.
Nombre de places	1
Requisits	• Linux • Programming (C++, bash scripts) • Webservices (HTML5, Flash) • Networking • Media Design & Usability (work package 1)
Compensations	A compensation will be given.

Codi	D TrGnSys-Wess5
Estudis	Pla 92 i Graus
Data d'entrada	08.02.13
Tipus d'estada	PFC
Descripció	**Preventing connectivity to ground LTE networks from airborne in-cabin UEs through steering of roaming** 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 December2008, 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) 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. Objectives 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 a SoR-based method to avoid connectivity to ground networks from airborne UEs. Methodology 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. Month 1: Study of LTE & SoR. Literature review. Month 2: Continued literature review. Proposition of draft techniques.

	Mid-term presentation. Month 3: Continued literature review. Refinement of proposed techniques. Month 4: Final draft of techniques. Writing up. Final presentation.
Inici	September 2013.
Durada	Minimum duration of 6 months.
Nombre de places	1
Requisits	Analytical & problem-solving skills. Mathematical thinking. High english level. Basic knowledge of cellular networks (desired).
Compensacions	A compensation will be given.

Codi	D TrGnSys-Wess6
Estudis	Pla 92 i Graus
Data d'entrada	08.02.13
Tipus d'estada	PFC

Descripció	**Design & implementation of a touch-sensitive GUI for a rapid deployment unit for emergency communications**
	
	Background
	
	TriaGnoSys currently participates in the European research project ABSOLUTE (Aerial Base Stations with Opportunistic Links for Unexpected and Temporary Events). This project will introduce a rapidly deployable UMTS and LTE network based on Low Altitude Platforms (LAPs) and Portable Land Units (PLUs) for the support of disaster-relief activities.
	In the ABSOLUTE network, voice and data traffic from victims and/or first respondents is routed through the PLU and backhauled over S-band satellite links to the PSTN, the Internet or to a remote emergency coordination centre. In this context, the PLU aggregates multiple interoperable communication systems steered by the PLU users. The current Thesis tackles the functionalities of the PLU-user interface through the design of a Graphical User Interface to be used through a touchscreen in the PLU.
	
	Objectives
	
	1. To design a GUI that is:
	
	    User-friendly to first respondents.
	    Interoperable with the TriaGnoSys PLU.
	    Lightweight on the computation platform.
	    Usable in the ABSOLUTE scenarios.
	    Applicable to the ABSOLUTE use cases.
	
	2. To design & perform usability tests
	3. To implement the designed GUI
	4. To document the work undertaken
	
	Methodology
	
	1. Understanding the basics of TriaGnoSys emergency communications suite.
	2. Understanding the basics of web-based GUI design such as HTML5, CSS3, PHP and Javascript.
	3. Programming the designed GUI and integrating it into the PLU.
	4. Testing.
	5. Documentation writing
	
	Month 1:
	
	Literature review
	Design (mockup)
	
	Month 2:
	
	Implementation & Integration
	Mid-term presentation
	
	Month 3:
	
	Continued implementation
	Debugging & Testing
	
	Month 4:
	
	Writing up
	Final presentation

Inici	September 2013.
Durada	The thesis shall have a minimum duration of 6 months.
Nombre de places	1
Requisits	Knowledge/experience in impressive GUI design with HMTL5. Knowledge of web servers (e.g. Apache, …). Experience working on Linux environments. Knowledge of communication systems such as UMTS, LTE and/or TETRA. Knowledge of wireless sensor networks. Experience in graphical representation of data.
Compensations	A compensation will be given.

Pixable

Pixable. New York, USA. Professor responsable: José Antonio Lázaro

Codi	USA Pixable_1
Estudis	Pla 92
Data d'entrada	12.02.13
Tipus d'estada	PFC
Descripció	**Contactive: a global social address book** Contactive is a social address book that enables users to engage with all of their contacts across different social networks (Facebook, Twitter, LinkedIn, Gmail and more) at a single point. It also associates each telephone number in the address book with publicly available information on repositories such as Google Places, Zagat, Yelp, etc. Building a global address books (with billions of numbers) have numerous challenges that will be investigated during the student's stay: - Extract contact information from private and public repositories efficiently. - Build and maintain an identity graph that incorporates all the information gathered from all its users, including the address book fields and its connections on the different social networks. - Design a pairwise classifier, that given two contacts with different fields (name, address, last name, phone number(s), etc.) produces a match/no match result with certain degree of certainty. - Design a matching algorithm, that propagates the information acquired in the network through its edges (connections in the identity graph) and it has a reasonable cost and has the right convergence properties.
Inici	August 1, 2013
Durada	6-12 months (To be discussed with the candidates)
Nombre de places	1
Requisits	•Love for technology and solving problems through technology. •One of the best computer science/engineering students in her/his peer group. •Great coder who is ready to learn how to be a superb coder. •Knows PHP/Python/Java with some other technologies on the backend and rich web 2.0 style front end programming (Ajax). But basically someone that learns new languages and platforms extremely fast. •Intensely driven and proactive person. •Thrives on chaos, risk, and uncertainty.
Compensations	A compensation will be given.

M*Modal

M*Modal. Pittsburgh. USA. Professor responsable: Antonio Bonafonte

Codi	USA Modal_1
Estudis	Pla 92
Data d'entrada	12.02.13
Tipus d'estada	PFC
Descripció	**Diploma Thesis at M*Modal in Pittsburgh** M*Modal is a fast-moving speech technology company in the field of medical transcription. We have our own large vocabulary ASR platform, and massive amounts of (English telephony) data to work with. We work together with prospective candidates (and their advisors) to develop a topic for a thesis to match the knowledge and timeframe of the candidate.
Inici	June, 2013
Durada	We prefer a minimum length of the stay of 6 months and a maximum of 9 months. Between these two extremes, we work with the candidate/advisor to see which length of stay is optimal to obtain the goals in the topic.
Nombre de places	1

Requisits	Candidates should have some experience with scripting languages, language modeling and/or acoustic modeling and ideally have worked on a speech recognition project in the past. Basic programming skills in Java or C++ as well as a sound background in statistics/mathematics are a plus.
Compensations	A compensation will be given.

Codi	USA Modal_2
Estudis	Pla 92
Data d'entrada	12.02.13
Tipus d'estada	PFC
Descripció	**Diploma Thesis at M*Modal in Pittsburgh** M*Modal is a fast-moving speech technology company in the field of medical transcription. We have our own large vocabulary ASR platform, and massive amounts of (English telephony) data to work with. We work together with prospective candidates (and their advisors) to develop a topic for a thesis to match the knowledge and timeframe of the candidate.
Inici	September, 2013.
Durada	We prefer a minimum length of the stay of 6 months and a maximum of 9 months. Between these two extremes, we work with the candidate/advisor to see which length of stay is optimal to obtain the goals in the topic.
Nombre de places	2
Requisits	Candidates should have some experience with scripting languages, language modeling and/or acoustic modeling and ideally have worked on a speech recognition project in the past. Basic programming skills in Java or C++ as well as a sound background in statistics/mathematics are a plus.
Compensations	A compensation will be given.

Nokia Siemens

Nokia Siemens, Aalborg, Denmark

Codi	DK NSN Aal_1
Estudis	Pla 92
Data d'entrada	15.02.13
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 propagtion data from three-dimensional ray tracing tools.
Inici	September 1, 2013 (or potentially earlier)
Durada	8-10 months
Nombre de places	2
Requisits	Masters level, fundamentals of mobile communication systems and technologies, some knowledge of medium access and physical layer in wireless communication systems, C++ programming skills
Compensations	A compensation will be given.

Codi	DK NSN Aal_2
Estudis	Pla 92
Data d'entrada	15.02.13
Tipus d'estada	PFC
Descripció	**Design and implementation of advanced MIMO transceivers for B4G over a testbed network** The goal of the project is to design and implement MIMO transceivers aiming at interference mitigation/suppression over a Software-Defined Radio (SDR) platform. Solutions such as Interference Rejection Combining or channel aware precoding are expected to be addressed. The usage of a real platform allows the students to deal with issues related to the hardware inaccuracies of the cost-effective SDR devices which are typically neglected in the simulation studies.
Inici	September 1, 2013 (or potentially earlier)
Durada	8-10 months
Nombre de places	1-2
Requisits	Masters level, fundamentals of mobile communication systems and technologies, C++ programming skills
Compensations	A compensation will be given.

CERN

CERN. Ginebra, Suïssa

CERN, European Organization for Nuclear Research

Tipos de programas: **PFC i/o practicas**
Solicitud de plazas: Para todos los programas, la solicitud deberá hacerse a través de la web del **CERN** (http://www.cern.ch/) y los candidatos serán seleccionados por el CERN. Si es el caso, la Escuela podrá reconocer las práctica o proyecto como programa de movilidad.

Programas que la Escuela podría reconocer:

1. Summer Student Programme:
      a. Programa enfocado a realizar prácticas y proporcionar experiencia profesional.
      b. De 8 a 13 semanas
2. Technical Student Programme:
      a. Programa enfocado a estudiantes que deseen realizar su proyecto final de carrera.
      b. 12 meses
      c. Existen 3 convocatorias al año con comités de selección para cada una de ellas
      d. La próxima convocatoria finaliza el próximo 5 de Marzo.
3. Open Lab Student Programme:
      a. Programa enfocado a realizar prácticas y proporcionar experiencia profesional.
      b. 9 semanas en verano.

DLR – German Aerospace Centre, Institute of Communications and Navigation

DLR – German Aerospace Centre, Institute of Communications and Navigation, Oberpfaffenhofen-Wessling, Germany. Professor responsable: Josep Prat

Codi	D DLR Wess-1	
Estudis	Pla 92	
Data d'entrada	19.02.13	
Tipus d'estada	PFC	
Descripció	**Novel Handover Techniques for Smart Gateway Diversity** Current satellite systems' capacities vary from 10 Gbps to 100 Gbps. Considering the future traffic demands, the raw capacity should approach a Terabit/s by 2020 to meet these demands. Hence, the migration to Ka band or even to Q/V bands is considered a necessity. This means that the feeder links should operate at least in Q/V band while the user-terminal links in Ka band. But migrating to these higher bands in order to have access to more available spectrum, where the signal experiences higher attenuation, especially for the Q/V band feeder links, the system is thus more vulnerable to rain over the gateways. As a results, the loss of a gateway communications affects all the users who are connected through it. Services such as teleconference and telemedicine, which are subject to high availability requirements, are more susceptible. It is envisaged that future systems may inter/connect gateways to allow traffic routing between them, a so called 'Smart Gateway diversity' scheme. To this end, performing traditional handover between any two gateways will lead to packet loss, which in turn will result in system performance degradation. The aim of this thesis is to study new handover techniques based on cutting-edge technologies in communication networks. This study will result in seamless handover between gateways, which will enhance the overall system performance. The expected output of this task is system design and protocol development. Further, the overall system performance should be analyzed. Tasks: System Analysis, protocol development, and evaluation.	
Inici	July 1 (or earlier).	
Durada	6-8 months	
Nombre de places	1	
Requisits	Background knowledge of radio communications systems and communications networks. Background knowledge of satellite communications - desired. Programming Languages: C/C++, Matlab. Fluency in English.	
Compensacions		

Alcatel-Lucent

Alcatel-Lucent. Nozay, France. Professor responsable: José Antonio Lázaro

Codi	FR Alcatel_1	
Estudis	Pla 92	
Data d'entrada	12.02.13	
Tipus d'estada	PFC	
Descripció	**WDM Optical Fiber Networks** Company: Alcatel-Lucent FRANCE (www.alcatel-lucent.com) Alcatel-Lucent has helped weave the technological fabric of modern society. Since its founding technology from Alcatel-	

Lucent has shaped the ways people live, work and play. Over the past years, Alcatel-Lucent R&D community has made seminal scientific discoveries, created powerful new technologies, and built the world's most advanced and reliable networks.

Project:
Fiber-optic communications are evolving from simple intensity modulation with direct detection systems towards sophisticated multilevel modulation with coherent detection. Furthermore, digital signal processing techniques are also under development to overcome the main limitations given by transmission impairments. The project will focus on research and development of specific topics related with WDM Optical Fiber Networks.

Location: Alcatel-Lucent France
Centre de Villarceaux
Route de Villejust
91620 Nozay

Inici	September 2013 to February 2014	
Durada	6-9 months	
Nombre de places	1	
Requisits	Fiber-optic communications, digital communications, signal processing, laboratory skills, Matlab simulation, excellent academic records, good English knowledge.	
Compensations	A compensation will be given.	