

Empreses on pots fer el PFC

Empreses i Institucions que ofereixen projectes a l'ETSETB i que gestiona l'escola Última actualització: 15 d'octubre 2009

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

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

[ORANGE UK](#)

[EPFL](#)

[Continental, A.D.C. GmbH](#)

[TriaGnoSys GmbH](#)

ORANGE UK

ORANGE UK (Bristol, United Kingdom)

Codi	UK ORANGE – 1
Data d'entrada	07/10/09
Tipus d'estada	PFC
Descripció	<p>Radio access network SW/HW validation</p> <p>The student will be involved in the validation of a certain piece of SW or HW in the Orange UK 2G/3G network. The work will include the evaluation of the new features, creation of a test plan, execute the testing laboratory phase, analyse the live trial statistics and finally run an E2E test campaign in the field to measure the network performance. The student will be responsible for the production of accurate technical reports including recommendations to aid the decision making process with regards to Go/No Go decisions for the Orange Group.</p> <p>The scope of the project is susceptible to change if forced by unforeseen circumstances.</p>
Durada	6 to 9 months
Requisits	<p>Must have skills</p> <ul style="list-style-type: none"> Accomplished a high academic standard, ability to learn quickly and autonomously. Troubleshooting and investigation skills are also required. Have an academic profile mainly focused in mobile network technologies such as GSM/3G/HSPA having studied some of the following subjects: Mobile Communications laboratory; Cellular access networks; Multimedia mobile communications; 3G mobile systems and its evolution. Competent verbal and written English language skills, CAE or similar preferred if applicable. Have competent communications skills being able to work and coordinate tasks across different teams. Influence and persuasion skills are needed. <p>Nice to have skills</p> <ul style="list-style-type: none"> Have previous work experience in a student placement, especially valuable if it was in a mobile network operator environment. Have an in-depth knowledge in 2G, 3G and HSPA networks. Theoretical knowledge of RF propagation. Understanding of IP and MPLS networks. Experience using mobile network testing tools.
Nombre de places	1
Codi	UK ORANGE – 2
Data d'entrada	07/10/09
Tipus d'estada	PFC

	<p>Power saving strategies in mobile radio access networks</p> <p>As part of the green agenda Orange is determined to achieve power consumption savings across the company, which will bring savings in terms of OPEX and CO₂ footprint. Those savings could be achieved by shutting down some parts of the radio access network during the off-peak hours. The student will make a case study analysing the possible options, forecast energy savings, assess possible end user impact or risks, test the solution in the laboratory, deploy the solution in a trial area, measure the achieved savings and end user impacts. Finally the student will present and write report to the management assessing the viability of a possible a national roll-out. The student will also be asked to analyse and update the RAN counters according to the new network capabilities. The scope of the project is susceptible to change if forced by unforeseen circumstances.</p>
Descripció	
Durada	6 to 9 months
Requisits	<p>Must have skills</p> <ul style="list-style-type: none"> • Accomplished a high academic standard, ability to learn quickly and autonomously. Troubleshooting and investigation skills are also required. • Have a academic profile mainly focused in mobile network technologies such as GSM/3G/HSPA having studied some of the following subjects: Mobile Communications laboratory; Cellular access networks; Multimedia mobile communications; 3G mobile systems and its evolution; Energy management for information and communications systems. • Competent verbal and written English language skills, CAE or similar preferred if applicable. • Have competent communications skills being able to work and coordinate tasks across different teams. Influence and persuasion skills are needed. <p>Nice to have skills</p> <ul style="list-style-type: none"> • Have previous work experience in a student placement, especially valuable if it was in a mobile network operator environment. • Have an in-depth knowledge in 2G, 3G and HSPA networks. • Theoretical knowledge of RF propagation. • Understanding of IP and MPLS networks. • Experience using mobile network testing tools
Nombre de places	1
Codi	UK ORANGE - 3
Data d'entrada	19/10/09
Tipus d'estada	PFC
Descripció	<p>Radio Systems</p> <p>There now exists a need to develop a tool that will simulate different combinations of packet switched QoS mixes (e.g. ftp, streaming+email, ftp+web, web+email... etc) and generate packets. This can be used for optimising the parameters/features that control resource on HSDPA/HSUPA and R99 NRT. Ideally this should be scriptable so that we can scale it to PtMP Server-client relationships allowing for multiple users.</p> <p>HSPA for multiple users on a real network brings a lot of new challenges. How different parameters controlling resource allocation - both air interface and backhaul can lead to extreme scenarios; There is normally a trade-off between individual experience and capacity. Network vendors can provide us with features that allow for finer control of how resources are used, but that means we need to spend more time optimising the relevant parameters.</p>
Durada	6 to 9 months
Requisits	<ul style="list-style-type: none"> • Good academic profile with relevant knowledge on simulating tool. e.g. MATLAB; • Fast learner and able to adapt to change; • Software programming skills; • Knowledge on mobile network technologies such as GSM/3G/HSPA; • English language skills • Good communications skills
Nombre de places	1

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EPFL

EPFL (Lusanne, Switzerland)

Codi	CH EPFL Lau_1
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Data d'entrada	16/10/09
Tipus d'estada	PFC
Descripció	Webminer Mashup editor & Debugger We have developed a software library in Java and Javascript for extracting information from web sites, in a fast, distributed, scalable and robust way. Your project consist in developing a graphical user interface embedded in a Web browser.
Durada	6 to 7 months
Requisits	<ul style="list-style-type: none"> • Software developing
Nombre de places	1

Codi	CH EPFL Lau_2
Data d'entrada	16/10/09
Tipus d'estada	PFC
Descripció	Machine learning for web information extraction Apply machine learning techniques to improve our Webminer software.
Durada	6 to 7 months
Requisits	<ul style="list-style-type: none"> • Software developing • Machine learning/artificial intelligence
Nombre de places	1

Codi	CH EPFL Lau_3
Data d'entrada	16/10/09
Tipus d'estada	PFC
Descripció	Extended Regular Expression Library Extend regular expressions libraries (C, Java and PHP) for recursion and tree grammars. More info: http://lbd.epfl.ch/f/teaching/dprojects/david/Extended_Regular_Expression_Library.html
Durada	6 to 7 months
Requisits	<ul style="list-style-type: none"> • Java
Nombre de places	1

Codi	CH EPFL Lau_4
Data d'entrada	16/10/09
Tipus d'estada	PFC
Descripció	Product Comparator Website Develop a system/methodology to compare heterogeneous product catalogs from several vendors. The student will be faced with problems such as ontology matching and visualizations techniques.
Durada	6 to 7 months
Requisits	<ul style="list-style-type: none"> • Java • Databases • Data-mining
Nombre de places	1

Codi	CH EPFL Lau_5
Data d'entrada	16/10/09
Tipus d'estada	PFC
Descripció	Project for Linux kernel expert Ask for details : mobilitat@etsetb.upc.edu
Durada	6 to 7 months

Requisits	<ul style="list-style-type: none"> • C • Linux Kernel
Nombre de places	1
Codi	CH EPFL Lau_6
Data d'entrada	16/10/09
Tipus d'estada	PFC
Descripció	<p>On Demand Proxy Server</p> <p>Use cloud computing systems to implement a distributed system for proxy servers.</p>
Durada	6 to 7 months
Requisits	<ul style="list-style-type: none"> • Java • Distributed systems
Nombre de places	1
Codi	CH EPFL Lau_7
Data d'entrada	16/10/09
Tipus d'estada	PFC
Descripció	<p>Opinion Extraction in Bloomberg</p> <p>Implement "sentiment analysis" techniques to get opinions in news from Bloomberg and the like.</p>
Durada	6 to 7 months
Requisits	<ul style="list-style-type: none"> • Machine learning techniques
Nombre de places	1
Codi	CH EPFL Lau_8
Data d'entrada	16/10/09
Tipus d'estada	PFC
Descripció	<p>iPhone car sharing, cinema or music application</p> <p>Implement an iPhone application, from prototyping until marketing, making use of our datasets.</p> <p>Ask for details: mobilitat@etsetb.upc.edu</p>
Durada	6 to 7 months
Requisits	iphone developer.
Nombre de places	1
Codi	CH EPFL Lau_9
Data d'entrada	16/10/09
Tipus d'estada	PFC
Descripció	<p>Mining global terrorism data</p> <p>The Global Terrorism Database (GTD) is an open-source database including information on terrorist events around the world since 1970. The project consist in applying data-mining and visualization techniques to get more insight about the domain.</p>
Durada	6 to 7 months
Requisits	Databases, Java or C++
Nombre de places	1

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Continental, A.D.C. GmbH - Lindau, Germany

Codi	D CONTINENTAL_Lin_1
Data d'entrada	19/10/09
Tipus d'estada	PFC
Descripció	<p>Assessment of Tracking Performance for a Automotive Applications</p> <p>Our company develops state of the art driver assistance systems employing radar and camera sensors for an accurate detection and tracking of traffic participants. A key element in the system development is the evaluation and benchmarking of existing vehicle tracking algorithms.</p> <p>The offered position implies the development of algorithms for automatic offline evaluation of tracker performance. The assessment should be done automatically on a database of recorded real traffic scenarios. Following tasks should be addressed: assessment of essential tracker performance parameters, development of a statistical collector for performance data, assessment of high performance tracking methods applicable for offline data, development of a reference offline tracking algorithm for automatically generation of reference ground truth data, performance evaluation by comparing existing tracking with generated ground truth, implementation on target platform, documentation.</p>
Durada	at least 6 month.
Requisits	ability of analytic and structured working, programming knowledge in Matlab and C/C++, knowledge of basic statistic methods and/or Kalman filtering, systems and signals lecture and competence, enthusiastic to study and develop new algorithms, good English language skills.
Nombre de places	1
Codi	D CONTINENTAL_Lin_2
Data d'entrada	19/10/09
Tipus d'estada	PFC
Descripció	<p>Development of compression algorithms to save resources and costs in ADAS Measurement Processes</p> <p>During the development process of Advanced Driver Assistance Systems (ADAS) it is required to record the measurement data from the involved ECUs for later analysis. For this purpose the recorder measurement object is available within the measurement system, which stores the measurement data to the disk using a custom data format. The player measurement object enables playing back the recorded data for offline analysis.</p> <p>The amount of measurement data that should be stored for sensor validation is immense due to very high data rates of the new ECU families (up to 120 MByte/s per ECU) and the duration of recordings. Since storing this amount of data involves extremely high costs on IT equipment (availability, back-up, etc.) it is necessary to evaluate data reduction measures like compression. Another drawback of the high data rate is the limitation of sensor validation bandwidth. The task of this internship / master thesis is to define several scenarios that integrate compression in the recording/storing process. This could involve software and hardware compression solutions. The decompression of data during software simulation should be considered as well.</p> <p>In detail the following steps are intended: introduction to the current data acquisition system and storage solutions, introduction to currently evaluated data compression technologies, definition of several scenarios that integrate compression, workout one or two scenarios in detail, documentation of the concept / implementation.</p>
Durada	at least 6 month.
Requisits	high programming knowledge, C++ knowledge, very good English
Nombre de places	1
Codi	D CONTINENTAL_Lin_3
Data d'entrada	19/10/09
Tipus d'estada	PFC
Descripció	<p>Design and Evaluation of different Runtime – and Memory – efficient Methods for storage of Radar-Sensor-Observation History over Time or Distance</p> <p>To improve the situation interpretation algorithms in sensor systems for automotive applications the history of the observed measurements has to be kept in an environment with very strict limitations regarding memory consumption and runtime performance.</p> <p>The subject of this thesis will be the development and evaluation of different methods and algorithms to store automotive driving scene knowledge in data structures with low memory consumption and moderate computation efficiency. Related Topics are occupancy maps, Mip-Mapping, etc. ...</p>

	Typical topics of this work are: literature research, rapid prototypic algorithm implementation (any known language, preferable Matlab), implementation on target platform (ANSI-C), benchmarking on target platform based on defined key values, documentation.
Durada	at least 6 month.
Requisits	ability of analytic and structured working, knowledge in Matlab scripting, good knowledge in C programming, good knowledge in theoretical computer science, substantiated state of knowledge in efficient algorithms, good knowledge in graphical data Processing, systems and signals lecture and competence, good English language skills, driver licence.
Nombre de places	1
Codi	D CONTINENTAL_Lin_4
Data d'entrada	19/10/09
Tipus d'estada	PFC
Descripció	<p>Evaluation tool for the performance evaluation of automotive camera systems</p> <p>Several camera based functionalities have already been implemented in the automotive sector. This includes for example traffic sign recognition, intelligent head lamp control, and lane departure warning. Using a high dynamic camera system, all these function can be provided with one single camera. Each of the functions listed above causes different design and operational constraints for the appropriate optics, the imager selection and the electronic measurement circuits.</p> <p>The functional performance in general is determined by empirical testing on the public road system or at special test facilities. Results are record in log - files and in video sequences which later on can be analyzed. One drawback of this method especially on public road is, that the environmental conditions for every test run change as well as the traffic conditions. In consequence one test run can never be 100% identical to another. Task description:</p> <p>Generation of a tool (preferably Matlab based) for the subsequent modification of a test video sequence. This includes: generation of an i/o interface for reading and storing of video sequences, generation of algorithms for the modification of single frames. For example change of brightness, noise values, sharpness and so on, test of the tool with real video sequences, performance evaluation for different camera functions with the modified video sequences</p>
Durada	at least 6 month.
Requisits	good communication skills in German and/or English, sound knowledge of Matlab, preferably some experience in GUI programming with Matlab, working knowledge of Office Tools (Excel, Word, etc...).
Nombre de places	1
Codi	D CONTINENTAL_Lin_5
Data d'entrada	19/10/09
Tipus d'estada	PFC
Descripció	<p>Fusion of Front and Side Information in order to improve existing ADAS Functions</p> <p>In order to improve the performance of the Continental Driver Assistance functions as e.g. Adaptive Cruise Control (ACC), Blind Spot Detection (BSD) or Lane Departure Warning (LDW) a sensor information fusion (technology independent) shall be developed and the sensor external information shall be used in the corresponding functions for e.g. suppression of false warnings on guardrails.</p> <p>The main tasks of the diploma thesis work are the requirements engineering and fusion design, the implementation of the information fusion on PC (in an existing MS Visual Studio C/C++ IDE), the use of the "sensor external information" for the improvement of e.g. the Continental BSD function and the validation / benchmark of the functional improvements in a demonstrator vehicle.</p>
Durada	at least 6 month.
Requisits	good physics and statistics knowledge at bachelor level, basic C/C++ programming experience, well structured English.
Nombre de places	1
Codi	D CONTINENTAL_Lin_6

Data d'entrada	19/10/09
Tipus d'estada	PFC
Descripció	<p>Useful Crosstalk Evaluation for an IR-Laser Sensor</p> <p>The Continental plant in Lindau (Lake Constance) is developing innovative Driver Assistance Systems for more comfort and safety. This project is dealing with an IR laser range sensor (LIDAR) which captures the environment of a vehicle in order to warn the driver or to initiate an emergency braking maneuver. In this context we are looking for a master thesis student to investigate approaches for an useful evaluation of optical crosstalk (e.g. detection of component failures, distance components. Chassis & Safety calibration, dirt detection).</p> <p>Your Tasks: measurement and analysis of optical crosstalk, investigate approaches for crosstalk evaluation, implementation of measures by means of signal processing, implementation of measures by means of optical signal path, definition, execution and evaluation of tests, test drives with test vehicles</p>
Durada	at least 6 month.
Requisits	you are studying Electrical Engineering, Physics, Optics, Microsystems Technology, Automotive Engineering, Mechanical Engineering, computer science or comparable study paths; digital signal processing, experience with Matlab are advantageous, basic knowledge in optics, good language ability (English or German), fast comprehension, analytic skills, creativity and team spirit.
Nombre de places	1
Codi	D CONTINENTAL_Lin_7
Data d'entrada	19/10/09
Tipus d'estada	PFC
Descripció	<p>Increasing Range of IR-Laser Sensor</p> <p>The Continental plant in Lindau (Lake Constance) is developing innovative Driver Assistance Systems for more comfort and safety. This project is dealing with an IR laser range sensor (LIDAR) which captures the environment of a vehicle in order to warn the driver or to initiate an emergency braking maneuver. In this context we are looking for a master thesis student to investigate approaches to improve the range of the sensor without changing the optics.</p> <p>Your Tasks: design and implementation of approaches by means of signal processing, design and implementation of approaches by means of receiver and amplification circuitry, definition, execution and evaluation of test procedures, compare and rate approaches, test drives with test vehicles.</p>
Durada	at least 6 month.
Requisits	digital signal processing, experience with Matlab are advantageous, basic knowledge in optics, good language ability (English or German), fast comprehension, analytic skills, creativity and team spirit
Nombre de places	1
Codi	D CONTINENTAL_Lin_8
Data d'entrada	19/10/09
Tipus d'estada	PFC
Descripció	<p>Optimal Object Modelling and Tracking for an Automotive Application</p> <p>Our company develops state of the art driver assistance systems employing radar and camera sensors for an accurate detection and tracking of traffic participants. Therefore it is necessary to develop algorithms that model the environment and associate sensor data to modelled objects.</p> <p>The offered position implies the implementation of a new approach to tracking and data association for radar reflections. A new object model has to be defined. Furthermore, the characteristics of this new approach should be evaluated in terms of RAM and CPU usage as well as tracking performance.</p> <p>The necessary tasks include: definition of the concept and design of the new tracking approach, implementation of a suitable Kalman tracker, implementation of efficient data association techniques, code Implementation in C for simulation and if possible embedded, documentation.</p>
Durada	at least 6 month.

Requisits	ability of analytic and structured working, programming knowledge in Matlab and C/C++, knowledge of basic statistic methods and/or Kalman filtering, systems and signals lecture and competence, enthusiasm to study and develop new algorithms, good English language skills.
Nombre de places	1
Codi	D CONTINENTAL_Lin_9
Data d'entrada	19/10/09
Tipus d'estada	PFC
Descripció	<p>Benchmarking of Road-Geometry Estimation for a Automotive Applications</p> <p>Our company develops state of the art driver assistance systems employing radar and camera sensors for various kinds of Driver Assistance Functions .A key element in the system development is the evaluation and benchmarking of existing algorithms and in particular the Estimation of the surrounding road-geometry. The offered position implies the development of algorithms for automatic offline evaluation of Road-Geometrie-Estimation. The assessment should be done automatically on a database of recorded real traffic scenarios. Following tasks should be addressed: assessment of essential estimator performance parameters, development of a statistical collector for performance data, development of a reference offline reference algorithm for automatically generation of reference ground truth data, performance evaluation by comparing existing estimation with generated ground truth, documentation.</p>
Durada	at least 6 month.
Requisits	programming knowledge in Matlab and C/C++, knowledge of basic statistic methods and/or Kalman filtering, enthusiasm to study and develop new algorithms, good English language skills.
Nombre de places	1
Codi	D CONTINENTAL_Lin_10
Data d'entrada	19/10/09
Tipus d'estada	PFC
Descripció	<p>Development of an evaluation chain for an automotive sensor system with joined radar and camera object detection.</p> <p>To improve the object assessment performance of sensor systems for automotive applications multi-sensor systems will be used for upcoming products.</p> <p>The subject of this thesis will be the development of an objective evaluation chain to find and document advantages and limitations of the involved sensors (e.g. radar, camera) in different kinds of realistic traffic scenarios. Typical topics of this work are: definition of relevant test cases, data acquisition</p> <p>Comparison of sensor object detection results, design and development of a highly automated evaluation chain to gain statistical meaningful results without the risk of operational errors, database oriented storage and processing of results, deliver statistical data for sensor fusion system design and performance evaluation, documentation</p>
Durada	at least 6 month.
Requisits	ability of analytic and structured working, programming knowledge in C, C++ and MATLAB, basic data base knowledge, systems and signals lecture and competence, knowledge in statistical decision theory and analysis, driver license, good English language skills, optional: basic German skills (e.g. reading specification documents).
Nombre de places	1
Codi	D CONTINENTAL_Lin_11
Data d'entrada	19/10/09
Tipus d'estada	PFC
Descripció	<p>Development of an evaluation of a Turn-Assistant Function based on 24GHz Radar Sensors from a current Continental Radar Base Project.</p> <p>Development and Evaluation of a Turn-Assist Function based on 24Ghz Radar Sensors from a current Continental Radar Base Project.</p> <p>The Continental "Turn-Assist" (TAS) function assist the drivers (esp. of a truck) while the vehicle (incl. the trailer) turns into</p>

	<p>another direction e.g. at a road junction. The function shall alert the driver (visually or audibly) when a licensed vehicle is detected by the Conti 24GHz Short Range Radar Sensor (SRR) on a potential collision trajectory at the side of the TAS carrying vehicle.</p> <p>The main tasks of the diploma work are the requirements engineering for the Turn-Assist function, the implementation of the Turn-Assist function (based on existing MS Visual Studio C/C++ development environment), support of the setup of a TAS demonstrator vehicle and the validation / benchmark of the TAS function. Also the detection of passengers and bicycles with the Conti 24GHz SRR Sensor has to be investigated in typical road scenarios (e.g. traffic light at junctions).</p>
Durada	6 months (01/02/2010 – 04/01/2010).
Requisits	good physics and statistics knowledge at bachelor level, basic C/C++ programming experience, fast comprehension, well structured English.
Nombre de places	1

Codi	D CONTINENTAL_Lin_12
Data d'entrada	19/10/09
Tipus d'estada	PFC
Descripció	<p>Text Recognition with HMMs for Speed Limit Information Systems</p> <p>Speed Limit Information (SLI) systems are used to display information to the driver about the maximum speed limit valid for the current road and any restrictions associated to it, e.g. speed limit is only valid for trucks or only valid if the road is wet. This is achieved by using a camera-based system which detects the speed limit signs and reads the numbers within the sign and eventually also the contents of the supplemental signs.</p> <p>Current SLI systems read the number within the speed limit sign by classifying the whole digit block of 1, 2 or three digits as a single class, i.e. the number 10, 20, 30, 40 and so on are different classes in the classifier. This has some disadvantages since, for example, training samples for some speed limit signs may be hard to find. Additionally, the information in the supplemental signs is usually in text form and recorded with low resolution, so that it can be very difficult to decode the contents using the conventional polynomial classifier approach.</p> <p>The idea is to use Hidden Markov Models (HMM) to model the single digits, i.e. 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, in a analogous way as in Speech Recognition and to combine these single digit models to form the numbers, i.e. 65 or 70. Analogously, the approach to read the low resolution text inside the supplemental signs would be to model the single words with HMM and to model the text lines in the sign with the concatenated HMM word models.</p> <p>The student's tasks would be: design and implementation of a training methodology for the HMM based on the usual algorithms (Baum-Welch or Segmental K-means), design and implementation of a test framework for the trained HMM, i.e. test sample selection, scripts, etc..., perform experiments using different feature extraction methods, perform experiments using different HMM parameters and topologies, write a diploma thesis describing the approaches and experiments, and summing up results and conclusions.</p>
Durada	at least 6 months.
Requisits	sound Knowledge of Statistical Mathematics (HMMs) and Image Processing, good communication skills in German and/or English, good programming skills in Matlab and C/C++, working knowledge of Office Tools (Excel, Word, etc...).
Nombre de places	1

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TriaGnoSys GmbH

TriaGnoSys GmbH (Wessling-Oberpfaffenhofen, Germany)

Codi	D TriaGnoSys Wess_1
Data d'entrada	14/01/10
Tipus d'estada	PFC
Descripció	<p>Security in Air Traffic Management (ATM) Network</p> <p>Air Traffic Management (ATM) communication is divided into two different domains: safety-critical and non safety-critical communications. Air Traffic Control (ATC) and Airline Operational Control (AOC) fall into the first category, whereas Airline Administrative Communication (AAC) and Airline Passenger Communication (APC) fall into the second. Traditionally the two domains are strictly separated, with limited one-way communication from the safety to the non-safety domain. In addition proprietary communication equipments installed in each domain hinder information transfer among the domains, and between the aircraft and ground systems.</p> <p>In the future it is expected that more Components Off-The-Shelf (COTS) equipment will be used in the aircraft, due to the benefits they bring such as reduced cost, and enabling a more efficient information flow between aircraft and the ground infrastructure. In addition, safety related domain may benefit from the infrastructure installed for non-safety domain, e.g.</p>

	<p>increased available bandwidth provided by satellite link which was initially used for passenger Internet access. These two trends (safety-non safety integration and the use of COTS equipment) however heighten the potential security risks involved in air to ground communication. A careful security threat assessment and mechanisms to mitigate them need to be studied.</p> <p>The concrete work to be performed will be in the direction of investigating the security mechanisms in aeronautical telecommunications network. Some research activities related with aeronautical communications security have been conducted by the ICAO ACP WP-I, within the EU FP6 research project NEWSKY (http://newsky-fp6.eu/), and potentially more research studies. The first days of the work will be dedicated to background reading and literature survey to capture the state-of-the-art. The investigation space covers the Internet security protocols, including IPSec, TLS, HTTPS, etc., and the security requirements (in terms of data authenticity, integrity, and confidentiality) of aeronautical telecommunication network. The literature study will be followed by the main thesis work, where some independent research and creative concept proposals are expected from the candidate. Among the potential security concepts, one is envisaged to be implemented in the TriaGnoSys in-house IPv6 network test-bed.</p> <p>At the end of the period the candidate is expected to write a self-contained scientific report (diploma thesis), comprehensively summarizing the work performed. It is envisaged to jointly submit key results of the diploma work as a paper for an international conference and/or a journal paper. The thesis is to be written in English. The company supervisor will provide support and materials required for the candidate to perform his/her task.</p>
Durada	6 to 9 months.
Requisits	medium to advanced English language proficiency is required, basic to advanced knowledge in C/C++, scripting languages (e.g. awk, Perl, or Tcl), and Linux IP(v6) networking is strongly recommended, knowledge of LaTeX is welcome, a high level of commitment, engagement, and independent research capability are expected from the candidate performing this work; however, the challenge of the task can only be appropriately met by excellent team work, which shall be guaranteed by close contact and regular discussion among candidate and supervisor(s) throughout the whole period.
Nombre de places	1
Codi	D TriaGnoSys Wess_2
Data d'entrada	14/01/10
Tipus d'estada	PFC
Descripció	<p>Terrestrial Trunked Radio (TETRA) over Satellite</p> <p>Terrestrial Trunked Radio (TETRA) is an ETSI standard designed for professional mobile radio communications used by industry, governmental agencies, police, fire departments, rescue organisations, and the military. The architecture resembles GSM, but two central features are "push-to-talk" like group communication and direct mobile-to-mobile communication independent from a base station.</p> <p>This diploma thesis is embedded in the research project "e-Triage" supported by the German Federal Ministry of Education and Research and aiming at facilitating emergency communication in the situation of a mass casualty incident (MCI) by providing digital communication and input devices replacing paper-based triage systems. In order to provide maximal autonomy from terrestrial communication networks it is planned to backhaul terrestrial TETRA services via satellite communication.</p> <p>Aim of this diploma thesis is</p> <ul style="list-style-type: none"> • to review relevant literature and earlier focussing on TETRA backhauling via satellite, both in terms of theory and trials, and document prior work together with main challenges in systematic form; • to plan and specify a lab prototype system for TETRA backhauling via satellite (together with supervisor/TriaGnoSys experts), tailored to the needs of the e-Triage project; • to develop a lab prototype system able to transmit TETRA payload over an Inmarsat BGAN satellite terminal using an IP TETRA base station; • conduct, document and evaluate TETRA communication trials over the prototype system; • investigate and (optionally) implement optimisation measures to mitigate typical satellite characteristics (high delay, jitter, limited bandwidth) <p>The diploma thesis will be aligned with a related theoretical and simulative TETRA over satellite diploma thesis conducted with our project partner German Aerospace Center (DLR).</p>
Durada	6 months, preferred starting date is spring 2009
Requisits	medium to advanced English language proficiency; thorough understanding of communication protocols; basic to advanced knowledge in Linux IP networking, basic knowledge of TETRA and LaTeX are welcome; a high level of commitment, engagement, and independent research capability are expected from the candidate performing this work; however, the challenge of the task can only be appropriately met by excellent team work, which shall be guaranteed by close contact and regular discussion among candidate and supervisor(s) throughout the whole period.
Nombre de places	1

Codi	D TriaGnoSys Wess_3
Data d'entrada	14/01/10
Tipus d'estada	PFC
Descripció	<p>Optimization of Mobile IPv6 for Satellite Link in an Air Traffic Management (ATM) Network Test-bed</p> <p>Communication is essential in the management of any complex system, including air traffic control/management. Traditionally the communication need has been fulfilled using radio communication in the VHF band. However, the growth of the aeronautical industry will soon reach a state where the supporting system can no longer maintain the integrity and reliability of its operation due to lack of capacity.</p> <p>To enable efficient exchange of information, the different available and future communication link technologies need to be interconnected, forming a global heterogeneous aeronautical communication network. Within the EU FP6 project NEWSKY (NEtWorking the SKY, http://www.newsky-fp6.eu), TriaGnoSys has developed an IPv6-based network test-bed to emulate a network handover between a satellite and a terrestrial communication link. The handover imitates the situation of an aircraft moving from continental to oceanic airspace where satellite is the only communication means available.</p> <p>The test bed is already running using an implementation of Mobile IPv6 (MIPv6) protocol to enable handover between the communication links. Some tests involving handover in the middle of VoIP calls and FTP data transfer have been successfully demonstrated. The access network 1 is emulated using Linux network emulation software, whereas access network 2 is the Inmarsat BGAN satellite network.</p> <p>The concrete work to be performed will be in the direction of developing and implementing concepts for optimizing the IPv6 mobility protocol over the satellite link. The MIPv6 protocol was designed without specifically considering satellite links, where bandwidth is scarce and expensive. Some concepts to reduce the signaling overhead in MIPv6 for efficient use of the satellite link are envisaged. The most promising concept as the outcome of the study will be then implemented in the test-bed.</p> <p>Naturally the first days of the work will be dedicated to background reading and literature survey to capture the state-of-the-art. This will be followed by the main thesis work, where some independent research and creative concept proposals are expected from the candidate. At the end of the period the candidate is expected to write a self-contained scientific report (diploma thesis), comprehensively summarizing the work performed. It is envisaged to jointly submit key results of the diploma work as a paper for an international conference and/or a journal paper. The thesis is to be written in English. The company supervisor will provide support and materials required for the candidate to perform his/her task.</p>
Durada	6 to 9 months
Requisits	medium to advanced English language proficiency is required, 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, engagement, and independent research capability are expected from the candidate performing this work; however, the challenge of the task can only be appropriately met by excellent team work, which shall be guaranteed by close contact and regular discussion among candidate and supervisor(s) throughout the whole period.
Nombre de places	1