PFC Empreses (Primavera 2004-05)

Empreses on pots fer el PFC

Empreses i Institucions que ofereixen projectes a l'ETSETB i que gestiona l'escola
Última actualització: 09 de Desembre 2004

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.

ACCENTURE

NEC

NOKIA

EPFL

BOSCH

PHILLIPS

Blaupunkt GmbH

DLR

ACCENTURE

ACCENTURE (França-Sophia-Antipolis(Niça))

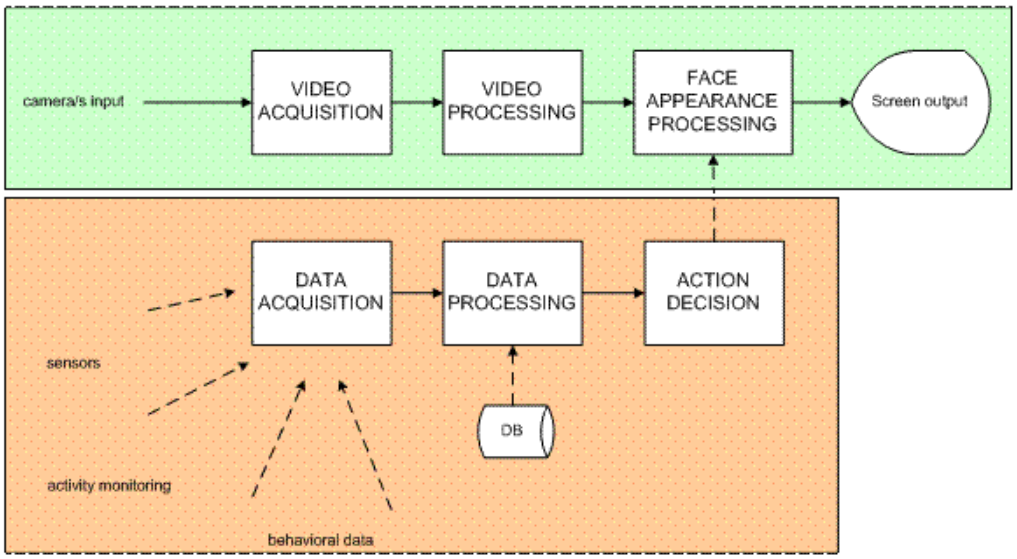
Codi	F Accenture Niç-1
Tipus d'estada	PFC
Descripció	**Recognizing complex activities in ambient video** Accenture Technology Labs (ATL) is the technology research and development organization within Accenture, a global consulting and IT services company. Its goal is to explore technologies three to five years from maturity and develop compelling prototypes that demonstrate the business implications of these technologies to Accenture clients. Within ATL, the Intelligent Home Services initiative focuses more specifically on the area of smart homes and services for the elderly. In this context, we are developing a passive surveillance system capable of recognizing, learning and analyzing daily activities performed by a person. There are several areas of application for such a system, including healthcare (e.g. in-home observation gives a better assessment of mobility than an out-of-context hospital visit), home assistance (e.g. offering prompts for completing complex tasks or issuing context-relevant reminders), or motivation for healthy living (e.g. using computerized persuasion to encourage a balanced diet). The current system is capable of tracking a person in an environment and logging their position in space. In order to handle complex daily activities, we need to recognize the actual activities (e.g. sleeping, cooking, or reading) and their temporal sequences (e.g. "get up", followed by "go to the bathroom", followed by "eat breakfast"). One way of doing the former is to train the system using a video sequence representative of a "normal" day [1,3]. For the latter, one possibility is to automatically find frequent sequential patterns in daily activity logs [2]. The system may then issue alerts when hazardous activity is detected, warning of unknown activity (e.g. visitors while sleeping), or activities that occur in unusual sequence (e.g. "turn on the stove" followed by "take a shower"). The intern will focus on the first part of the system: recognizing complex activities such as sleeping, cooking, and reading from ambient video. The goal will be to build a prototype demonstrating the concept and its feasibility. The intern will implement an algorithm inspired from the state-of-the-art research, extracting a motion feature vector representing each video frame, and learning the activity dynamics in the form of a Hidden Markov Model (HMM). Once trained, the resulting model should be able to tell what activity is the observed person engaged in, and signal any unknown behavior. The prototype will be programmed in C++, using Intel OpenCV [4]. The second part of the system is described in another internship proposal "Automated learning and forecasting of behavior".
Durada	The assignment will take between four to six months, beginning on January 2005 (dates are flexible)
Requisits	The student is expected to have (reasonable) working knowledge and strong affinity for the following topics: - Proficiency in C/C++ - Fluent English - Experience with computer vision or machine learning is a plus
Nombre de places	1

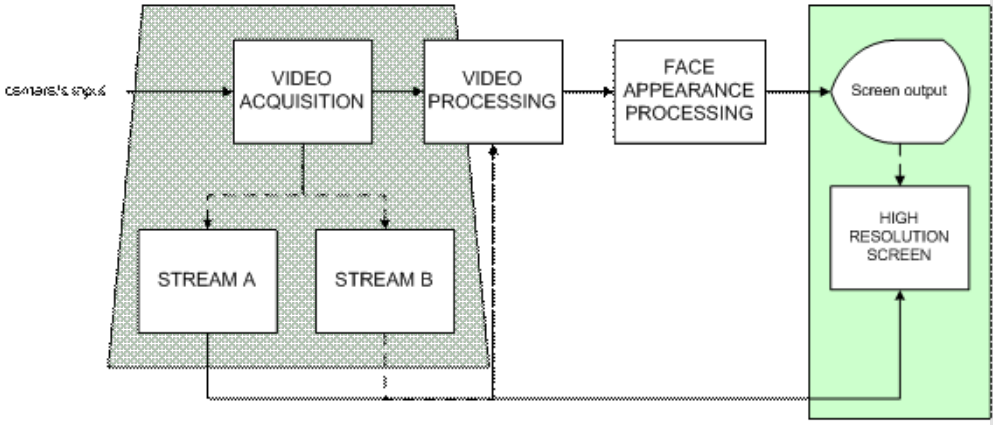
ACCENTURE (França-Sophia-Antipolis(Niça))

Codi	F Accenture Niç-2
Tipus d'estada	PFC
Descripció	**Automated learning and forecasting of behavior** Accenture Technology Labs (ATL) is the technology research and development organization within Accenture, a global consulting and IT services company. Its goal is to explore technologies three to five years from maturity and develop compelling prototypes that demonstrate the business implications of these technologies to Accenture clients. Within ATL, the Intelligent Home Services initiative focuses more specifically on the area of smart homes and services for the elderly. In this context, we are developing a passive surveillance system capable of recognizing, learning and analyzing daily activities performed by a person. There are several areas of application for such a system, including healthcare (e.g. in-home observation gives a better assessment of mobility than an out-of-context hospital visit), home assistance (e.g. offering prompts for completing complex tasks or issuing context-relevant reminders), or motivation for healthy living (e.g. using computerized persuasion to encourage a balanced diet). The current system is capable of tracking a person in an environment and logging their position in space. In order to handle complex daily activities, we need to recognize the actual activities (e.g. sleeping, cooking, or reading) and their temporal sequences (e.g. "get up", followed by "go to the bathroom", followed by "eat breakfast"). One way of doing the former is to train the system using a video sequence representative of a "normal" day [1,3]. For the latter, one possibility is to automatically find frequent sequential patterns in daily activity logs [2]. The system

	may then issue alerts when hazardous activity is detected, warning of unknown activity (e.g. visitors while sleeping), or activities that occur in unusual sequence (e.g. "turn on the stove" followed by "take a shower"). The intern will focus on the second part of the system: mining for sequential patterns of behavior based on the three-dimensional world position of the person. The goal will be to build a prototype demonstrating the concept and its feasibility. The intern will implement an algorithm that will mine through trajectories gathered from our current people tracking framework and integrate his work in this framework. Once integrated, the system will use its off-line learning to analyze live data in real time and make probabilistic forecasts of the person's behavior. The first part of the system is described in another internship proposal "Recognizing complex activities in ambient video".
Durada	The assignment will take between four to six months, beginning on January 2005 (dates are flexible)
Requisits	The student is expected to have (reasonable) working knowledge and strong affinity for the following topics: - Proficiency in C/C++ - Fluent English - Experience with machine learning is a plus
Nombre de places	1

ACCENTURE (França-Sophia-Antipolis(Niça))

Codi	F Accenture Niç-3
Tipus d'estada	PFC
Descripció	**he virtual mirror (Persuasive Mirror Project)** Visual Technologies (Image Processing and Computer Graphics) are starting to be used to enhance people's daily life. With the "Persuasive Mirror" project, researchers from the Accenture Technology Labs will study the technology behind building a device that visually motivates people to achieve their daily goals. The "Persuasive Mirror" is conceived to provide a new way of helping people, specifically the elderly, to achieve their personal goals. With this initiative, researchers at the Accenture Tech Labs aim at exploring the influence of captology (Computers As Persuasive Technologies) in ordinary people's life. In order to analyze this influence, researchers propose the creation of what has been called a "Persuasive Mirror"; an augmented-reality mirror capable of providing help using visual motivation feedback to encourage people to persevere in their goals, for instance, by encouraging healthy lifestyle. This will be done by analyzing activity data in a novel way and developing original and efficient visual technologies to replicate a natural home object: a mirror. The fist step of the complex procedure of building such a device (Figure 1 illustrates a general overview of the processing behind the project) will be to realistically recreate a mirror from image inputs.  The aim of this internship is to do research, study and develop a genuine and effective solution to create the 'virtual mirror' required to frame the "persuasive visual techniques/algorithms". Technically, the project will start evaluating the use of a high definition screen and two cameras. In this order: Using stereoscopic imaging techniques, the intern will have to replicate the visual feeling of a mirror (by blending

	the input coming from the two cameras). Furthermore, in a second step, he/she will have to compare the potential of applying image processing over the stereoscopic images separately against applying it over the blended resulting image on the mirror. He/she will have to evaluate the potential of the use of the 3D information that the stereoscopic input can give to the overall system. To achieve these goals, the intern will count on: - The support and technical guidance of a supervisor. - The needed technical resources to develop the project. - A proper and motivating work environment to do his/her job. 
Durada	The assignment will take between four to six months (extendable), beginning on January 2005 (dates are flexible)
Requisits	The student is expected to have (reasonable) working knowledge and strong affinity for the following topics: - Proficiency in C/C++ or Java - Fluent English - Experience with computer vision, image processing, good learning skills - Creativity - Willingness to do teamwork and capability of working autonomously
Nombre de places	1

inici de pàgina

NEC

NEC (Alemania-Heidelberg)

Codi	D NEC Hei-5
Tipus d'estada	PFC
Descripció	**3G/802.11e Traffic Engineering** Future 3G mobile terminals will include Wireless LAN capabilities due to its popularity and the success of this technology in offering high data rates at a low cost. The upcoming standard 802.11e defines mechanisms to provide Quality of Service which are required to guarantee a proper service to some applications, e.g., VoIP. 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 the necessary traffic engineering mechanisms for 802.11e to provide the desired levels of QoS in the particular case of 3G terminals.
Durada	6 months, beginning on March
Requisits	- C programming experience. - Good level of English. - Previous experience with network simulations and/or knowledge of the Wireless LAN technology will be valued.
Nombre de places	1

NEC (Alemania-Heidelberg)

Codi	D NEC Hei-6
Tipus d'estada	PFC
Descripció	**HIP Lookup Service** Based on HIP drafts, design and implement a HIT-to-IP (and back) lookup/resolution service based on anycast and DHTs, measure its performance, etc. (May also be TurfNet-related if we decide what TurfNet IDs are.)
Durada	Flexibility in the start dates
Requisits	C programming, Unix familiarity (Linux or BSD) and knowledge in IP networks.
Nombre de places	1

NEC (Alemania-Heidelberg)

Codi	D NEC Hei-7
Tipus d'estada	PFC
Descripció	**Cross-Layer Handshake Parallelization** Investigate protocol extensions that allow speculative parallelization of handshake exchanges across different network layers. For example, speculatively transmit the first packet of a SSL handshake in the SYN of the TCP handshake which in turn is speculatively transmitted in the payload of the first packet of the HIP base exchange. Design and measure. (This could even be sold as DTN-related, because it lets you be more efficient in using really short periods of connectivity.)
Durada	Flexibility in the start dates
Requisits	C programming, Unix familiarity (Linux or BSD) and knowledge in IP networks.
Nombre de places	1

NEC (Alemania-Heidelberg)

Codi	D NEC Hei-8
Tipus d'estada	PFC
Descripció	**Tolerating Bit-Pattern-Caused Losses** Looking at the current Internet from pretty far up, NATs, firewalls and other middleboxes create end-to-end paths where packet loss is based on specific bit patterns, i.e.,specific bit patterns cause a firewall to block a packet or enabel you to get through a NAT, etc. How can the current Internet protocol suite be extended to operate over such paths? The idea would be to learn which patterns cause losses or enable communication, and avoid them or put them in your packets.
Durada	Flexibility in the start dates
Requisits	C programming, Unix familiarity (Linux or BSD) and knowledge in IP networks.
Nombre de places	1

NEC (Alemania-Heidelberg)

Codi	D NEC Hei-9
Tipus d'estada	PFC
Descripció	**Efficient Use of Connectivity in Disruption Tolerant Networks** Play with XCP and other transport protocols, as well as proxies, in an extension of Simon's thesis.
Durada	Flexibility in the start dates
Requisits	C programming, Unix familiarity (Linux or BSD) and knowledge in IP networks.
Nombre de places	1

NEC (Alemania-Heidelberg)

Codi	D NEC Hei-10
Tipus d'estada	PFC
Descripció	**Security in Voice over IP** Security will get a more prominent issue in the deplyment of Voice over IP in large scale. The project looks into the issues and designs a set of solutions in that area.
Durada	Flexibility in the start dates
Requisits	C programming, Unix familiarity (Linux or BSD) and knowledge in IP networks.
Nombre de places	1

NEC (Alemania-Heidelberg)

Codi	D NEC Hei-11
Tipus d'estada	PFC
Descripció	**Automatic generation of software for network management** The building network management systems is very time consuming and error prone. The automation of this process based on common knowledge and given information models would make the systems much cheaper.
Durada	Flexibility in the start dates
Requisits	C programming, Unix familiarity (Linux or BSD) and knowledge in IP networks.
Nombre de places	1

NEC (Alemania-Heidelberg)

Codi	D NEC Hei-12
Tipus d'estada	PFC
Descripció	**Wireless LAN management** For large scale deployments of WLAN networks spezial measure must be taken to get a guaranteed service, specifically when integrated with 3G systems and networks.
Durada	Flexibility in the start dates
Requisits	C programming, Unix familiarity (Linux or BSD) and knowledge in IP networks.
Nombre de places	1

NEC (Alemania-Heidelberg)

Codi	D NEC Hei-13
Tipus d'estada	PFC
Descripció	**Simulative analysis of transport mechanisms in vehicular ad hoc networks** A challenging aspect of current ad hoc networking research is focusing on car-to-car communication - e.g., wireless multi-hop distribution of emergency notification messages. The most significant characteristic of these vehicular networks is the high degree of dynamic, resulting in frequent topology changes, which have to be considered in the design of network and transport-layer protocols. As an example, we will describe briefly the routing mechanism, as developed and implemented in the FleetNet project. The most promising routing approach in this environemt is 'position-based' routing, i.e., messages are forwarded on a per-hop basis, whereas the next hop is selected according to distance towards the destination. Therefore, every car must know its own position, which is accomplished via GPS and learns about its direct neighbours via beacons, which contain the GPS position. Furthermore, the position of the (final) destination must be known and is to be acquired via different forms of 'location services'. The most simple location service is to broadcast a request into the network and receive a reply in case the destination is reachable within a pre-defined distance in terms of number of hops. Position-based routing allows the addressing of a geographic region via GeoCast-messages, which is particularly beneficial for the distribution of emergency notifications, e.g., in order to warn only the cars behind me when encoutering the end of a traffic jam. After the successful completion of the FleetNet project, the 'Network on Wheels' (NoW) project continues the ad hoc networking research in vehicular communication networks, e.g., focusing on robust routing in realistic radio

	environments, map-assited routing in city scenarios and reliable data transport. This internship proposal addresses the latter aspect - reliabiliy and congestion control for vehicular ad hoc networks. Related work has shown, that the Transmission Control Protocol (TCP), which is the de-facto standard in the Internet, shows 'poor' performance in wireless environments and 'even worse' performance when considering multi-hop wireless ad hoc networks. There are many reasons for this performance degradation. The most distinctive example is that TCP assumes network congestion in case of packet loss (i.e., retransmission timeout), but in wireless ad hoc networks packet loss might also occur due to mobility (i.e., route changes after movement), channel errors due to the high Bit Error Rate (BER) of the error prone wireless channel or collisions. The currently known approaches within the related work in order to enhance the performance of the transport layer distinguish between modifications to TCP and completely new (non-TCP) mechanisms. The goal of the internship is a simulative and comparative evaluation of TCP enhancements and non-TCP approaches within a vehicular ad hoc network environment, in oder to determine the most suitable approach w.r.t. to performance (i.e., throughput), fairness and TCP interoperability or identify new congestion control and reliability mechanisms, which are particularly optimised for car-to-car communication. The simulative work will base on the ns2 network simulator.
Durada	Flexibility in the start dates
Requisits	basic knowledge in C, C++ and TCL/TK, as well as theoretical and practical networking knowledge and experience - e.g., the Internet Protocol IP, TCP and ad hoc networking protocols. The operating system will be Linux (e.g., Red Hat / Fedora), which should be familiar to the student.
Nombre de places	1

inici de pàgina

NOKIA

NOKIA (Dinamarca-Aalborg)

Codi	DK Nokia Aal-1
Tipus d'estada	PFC
Descripció	**High Sped Uplink Packet Access (HSUPA) in WCDMA/UMTS** HSUPA is a 3GPP rel 6 working item aiming at improving the spectral efficienty and provide higher user data rates in UL. One of the main feature HSUPA is that the packet scheduler is located at the Node B (instead of RNC), and hence has knowledge about radio interface conditions. This permits faster and more aggressive scheduling comparing to the RNC-controlled packet scheduler, resulting in higher peak bit rates and cell throughput. Resource allocation algorithms located at the RNC specifies the maximum amount of resources the Node B can assign to the HSUPA users. Different parameters should be taken into account when setting this value, e.g. packet scheduling period, number of currently inactive DCH users etc. The Master Thesis project should aim at design of resource allocation algorithm for HSUPA, investigate packet scheduling algorithms and its perforamnce by means of system simulations.
Durada	8 months, beginning on February 2005
Requisits	
Nombre de places	1-2

inici de pàgina

EPFL

EPFL (Suïssa-Lausanne)

Codi	CH EPFL Lau-LTS4
Tipus d'estada	PFC
Descripció	http://lts4www.epfl.ch/sprojects.html En aquest link trobareu diferents projectes. Heu de consultar aquest link i veure quins us interessarien del llistat "Diploma projects 2004-2005". La manera de sol·licitar-los és la següent: entreu a la Intranet, escolliu el codi "CH EPFL Lau-LTS4" i a l'apartat d'observacions poseu els noms que us interessin de la llista.
Durada	Starting time: February 2005 Duration: 6 months
Requisits	

Nombre de places	

EPFL (Suïssa-Lausanne)

Codi	CH EPFL Lau-10
Tipus d'estada	PFC
Descripció	**Spatial Atomic Transoform** Given a limited number of camera recording different views of a given scene, it is in theory possible to recreate artificially a different view from the same scene or even to create a 3D representation. See attached PDF file: Project Summary
Durada	Starting time: February 2005 Duration: 6-7 months
Requisits	Knowledge on signal processing, Matlab, Fluent English
Nombre de places	1

EPFL (Suïssa-Lausanne)

Codi	CH EPFL Lau-11
Tipus d'estada	PFC
Descripció	**Analysis of multimodal sequences using redundant parametric representations** The topic we are going to study in this project is that of correlating audio tracks with video data to detect those regions in image sequences from which the soundtracks originate. In particular, we will face the problem of detecting a person speaking, exploiting the correlation between audio and video signals. The peculiarity of the framework we are exploring is that of using sparse decompositions of audio-visual signals over redundant dictionaries to represent multimodal sequences. Such an approach has demonstrated to achieve promising results in correlating simple audio-video sequences. The goals of this project are to studying in detail audio and video representations, the relationships between them, and to learn a speaker model that takes into account the dependencies between acoustic and visual information. The project will be developed through four main steps: 1.- Study of the methods based on redundant dictionary expansions that we are using for the description of audio and video signals. Exploration of the state of the art about multimodal signals analysis. 2.- Analysis of audio and video features used to correlate multimodal sequences and test of new ones. 3.- Analysis of audio-visual fusion criteria and test of new criteria. 4.- Learning of a statistical multimodal model of speaker. For further details about the current research on that topic, please check the web page: http://lts2www.epfl.ch/~monaci/multimodal.html
Durada	Starting time: February 2005 Duration: 6-7 months
Requisits	Good background in signal processing and mathematics, Matlab, C++, Fluent English.
Nombre de places	1

EPFL (Suïssa-Lausanne)

Codi	CH EPFL Lau-12
Tipus d'estada	PFC
Descripció	**Ventricular Activity Cancellation by Sparse Decompositions** Atrial fibrillation (AF) (upper chambers of the heart) is the most common type of human arrhythmia. Beside its clinical description as absolute arrhythmia its diagnosis has been assessed for years by visual inspection of the surface electrocardiogram (ECG). Its underlying mechanism involving self-sustained multiple reentrant

	waves has been discovered several decades ago. Although there are many substrate abnormalities that may cause AF. However, AF is not as uniform as thought. It is rather a collection of more or less sustained atrial disorders. Due to the much higher amplitude of the electrical ventricular activity (lower chambers), isolation of the atrial activity component is crucial for the study of AF. Starting from the ECG, we aim at obtaining two different signals containing the isolated components of the ventricular activity and the atrial activity. This is a challenging problem since both components overlap in the frequency domain and are not orthogonal among them. Hence, simple filtering techniques are not able to separate them successfully. For this purpose, more powerful approaches are needed. During the past 10 years, many advances have been achieved by non-linear signal approximation methods, using overcomplete (non-orthogonal) sets of functions (dictionaries). In many applications these techniques offer higher performances than those based on orthonormal transforms. In this work, an approach to separate atrial and ventricular signal components decomposing the signal over a redundant multi-component dictionary will be explored. Three main milestones are proposed: 1.- Dictionary design: the dictionary that will be used to decompose the ECG signals should be flexible and robust. Its design must take into account the signal structures and characteristics. 2.- Decomposition: Being the dictionary overcomplete, more than one decomposition of a given signal are possible. Sparse solutions are considered to be the best ones. Useful techniques for these decompositions are given, among others, by Greedy Algorithms such as Matching Pursuit or optimization methods such as Basis Pursuit. A key point in this work, will be, jointly with the dictionary design, to determine the appropriate analysis technique for a best performance of the ECG components separation. 3.- Testing: the solution found has to be tested over relevant ECG databases.
Durada	Starting time: February 2005 Duration: 6-7 months
Requisits	Good knowledge in Signal Processing and applied mathematics. Will to learn more. Taste for exploring new fields and research. Fluent English.
Nombre de places	1

EPFL (Suïssa-Lausanne)

Codi	CH EPFL Lau-13
Tipus d'estada	PFC
Descripció	**Multimodal person recognition using audio and visual features** Multimodal signal processing is of great importance in the field of Human-Computer Interaction (HCI) due to the added values of robustness and naturalness as the result of synergistic information integration from different modalities. Over the past few years, the development of new interfaces (especially audio-visual) enables HCI systems for various applications such as banking, security systems, etc. to identify the user combining both speech and facial features information. Human perception is done in multimodal manner, which is demonstrated by well know McGurk effect. Most of the work done so far in the field audio video processing is based either on the usage of information from one of the available feature spaces (audio or visual), or just "putting them together" while the importance of their mutual interaction was often neglected. The aim of our research is to explore important correspondence between audio and visual cues using fundamental information theoretic concepts in order to find most informative subsets that will enhance person recognition results, especially in cases when environmental conditions are changed and noise is present in the scene. We have already obtained promising results in the domain of audio-visual speech recognition over the conventional unimodal systems. The goal of this project would be to focus on applying the same concept for the purpose of person identification using lip movement information and speech features. Visual and audio-visual speaker recognition tasks would be performed using Hidden Markov ModelToolkit (HTK): http://htk.eng.cam.ac.uk.
Durada	6 months, beginning on February 2005 (as soon as possible)
Requisits	- information theory, - image processing, - Matlab and/or C/C++, - basic Unix skills
Nombre de places	1

EPFL (Suïssa-Lausanne)

Codi	CH EPFL Lau-14
Tipus d'estada	PFC
Descripció	**Dual Surface-Volume Based Non-Rigid Registration of Brain Medical Images** Image registration can be defined as the problem of bringing two or more images into spatial correspondence. In other words, registration consists in finding an optimal geometric transformation between corresponding image data which maps each point of an image onto its corresponding point of another image. In the field of medical imaging the use of image registration is of capital importance. The need of registration in this field was born because of the difficulty for aclinician to mentally fuse images. The human brain surface shows a big variability between different patients so typical volume-based registration algorithms do not cope with these strong differences. The goal of the project is to combine surface and volume registration techniques in order to achieve accurate results both inside and in the surface of the brain.
Durada	6 months, beginning on February 2005 (as soon as possible)
Requisits	- good skill in C++/Matlab - and some background on signal(image) processing.
Nombre de places	1

EPFL (Suïssa-Lausanne)

Codi	CH EPFL Lau-15 (CANCEL·LAT)
Tipus d'estada	PFC
Descripció	**Eye and face tracking for behaviour analysis** Behavioural analysis of people is of growing importance in domains like marketing, choice analysis, etc. The marketing strategies of big companies are more and more defined based on such an analysis. For instance, how does the colour of a package of a product influence the decision of a customer to buy this product and not the next one on the shell? To collect this information, we need to be able to track where consumers look at in real or simulated situations. This project, open for one or two students, will develop and use image processing algorithms for analysing face and eye tracking data in real consumer behaviour analysis situations. An existing eye tracking devise will be used to collect the data. This project will be conducted in very close collaboration with a very big Swiss company, world leader in the food industry.
Durada	6 months, beginning on February 2005 (as soon as possible)
Requisits	C/C++, Matlab, image processing
Nombre de places	1-2

EPFL (Suïssa-Lausanne)

Codi	CH EPFL Lau-16
Tipus d'estada	PFC
Descripció	**Source Coding in Image Sensor Networks** Consider a three-dimensional static object that is photographed by N cameras. The cameras are spatially distributed to capture the object from different view-points. Each camera image will be encoded locally and transmitted to a central decoder. The decoder shall reconstruct the N camera images at best quality for a given total transmission bit-rate of the N image sensors. (Current work with video signals is explained in more detail here). The goal of this diploma project is to develop an image representation that is suitable for this distributed source coding scenario. The successful candidate will study distributed source coding techniques and, in particular, will focus on the underlying 3-d geometry of the object.
Durada	6 months, beginning on February/March 2005
Requisits	good programming skills in MatLab and C++, as well as excellent knowledge in image processing techniques and basic information theory. Experience with 3-d models/computer graphics is particularly helpful for this project.
Nombre de places	1

EPFL (Suïssa-Lausanne)

Codi	CH EPFL Lau-17
Tipus d'estada	PFC
Descripció	**Efficient Scalable Video Coding with Motion-Compensated Temporal Transforms on Spatial Subbands** Currently, the Moving Picture Experts Group (MPEG) - see also http://www.chiariglione.org/mpeg - is developing a new video coding standard utilizing motion-compensated temporal wavelets. The main goal of this project is to obtain highly scalable representations of video signals while maintaining compression efficiency. We have started to develop a scheme that employs motion-compensated temporal wavelet transforms to spatial subbands. The advantage is that this approach provides a spatially scalable representation while being rate-distortion efficient. The goal of this diploma project is to further develop this idea and to implement a video codec that outperforms designs that are currently discussed by MPEG.
Durada	6 months, beginning on February/March 2005
Requisits	excellent knowledge in image/video processing techniques as well as excellent programming skills in C++.
Nombre de places	1

EPFL (Suïssa-Lausanne)

Codi	CH EPFL Lau-18 (afegit: 09/12/04)
Tipus d'estada	PFC
Descripció	**Lip feature extraction for lipreading using geometric-based methods** Multimodal signal processing represents a challenging research area inthe field of Human-Computer Interaction (HCI) due to the fact thatinformation comes from several sources at the same time in the form of audio, video, images, text, etc. Humans perception of surrounding environment is based on a complex interaction between the senses in the brain (sight,hearing,touch,..), which is demonstrated by well know McGurk audio-visual illusion. Our particular field of interest is audio-visual speech processing, where most of the work done so far is based either on the usage of information from one of the available modalities or, just "putting them together" while the importance of their mutual interaction was often neglected. In order to befit from the fact that both modalities carry the complementary information, we want to explore the correspondence between audio and visual features using fundamental information theoretic concepts, entropy and mutual information. An initial step is the choice of visual representation of lip movement and according the state-of-the-art, can broadly be divided in two categories: image-transform and model-based techniques. The goal of the project is to focus on the former ones and extract lip contour information using some of the well known methods from image processing and computer vision, such as active shape models,active contour models or deformable templates. After the pre-processing step, mutual information approach should be applied for selection of those visual features among extracted ones, that are most correlated with audio cues.
Durada	6 months, beginning on February 2005 (as soon as possible)
Requisits	image processing, information theory, Matlab and/or C/C++.
Nombre de places	1

inici de pàgina

BOSCH

BOSCH (Alemania-Hildesheim)

Codi	D Bosch Hil-1
Tipus d'estada	PFC
Descripció	**Project on Digital Multimedia Broadcasting** Based on the Europeen DAB Standard Eureke 147 improved data transmission capabilities should be evaluated, implemented an combined with applications like Dataservices (Broadcast Web Side) or video transmissions based on the H.264 Standard. Several sub-projects are available. **Subject 1:** *(one student):* Generating test signals based on DAB Packet Mode with a new enhanced error protection (RS-Code) and virtual interleaving should be generated. A offline decoder has to be implemented. The performance and robustness should be analysed based on channel simulations with a real transmission line

	(Transmitter/Receiver). Improvements like interleaver size should be proposed.
Durada	Starting time: February 2005 Duration: 6 months
Requisits	-
Nombre de places	1

BOSCH (Alemania-Hildesheim)

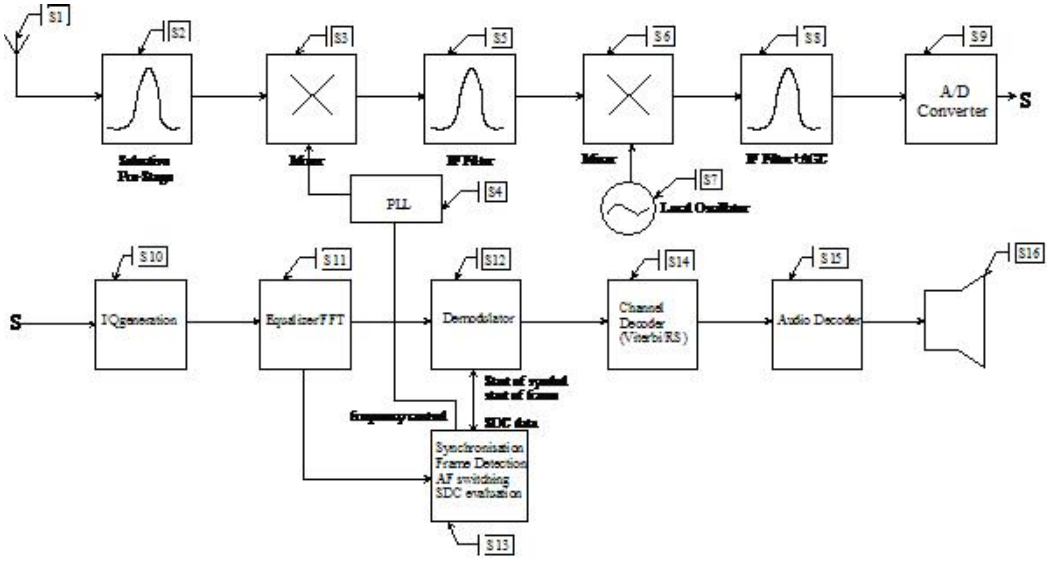
Codi	D Bosch Hil-2
Tipus d'estada	PFC
Descripció	**Project on Digital Multimedia Broadcasting** Based on the Europeen DAB Standard Eureke 147 improved data transmission capabilities should be evaluated, implemented an combined with applications like Dataservices (Broadcast Web Side) or video transmissions based on the H.264 Standard. Several sub-projects are available. **Subject 2:** *(two students):* The algorithm for a Reed Solomon decoder RS(204,188) should be deeply analysed. A highly optimised implementation on 2 different platforms (PDA with ARM/Xscale Core and an embedded DAB receiver with MIPS core) should be realised. For example is byte wise XOR is a frequently used operation in RS decoding. A 32-Bit processor could realise this in one machine cycle if the data is adequately arranged. A complete multiplication table 2^8 by 2^8 = 16kByte should be considered. 1. *Theoretic part (one student):* Translate the RS decoder algorithm from a mathematical description to a procedural description. Vary the data processing to realise 4 Byte (32 Bit) operations. Use tables for multiplication. 2. *Practical part (one student):* Implement a RS deocoder on a PDA as part of a video decoding application. Then realised a optimised assembler implementation (ARM and MIPS) including synchronisation and de-interleaving. Also an extraction of IP packets in packet mode transmissions should be realised.
Durada	Starting time: February 2005 Duration: 6 months
Requisits	-
Nombre de places	2

BOSCH (Alemania-Hildesheim)

Codi	D Bosch Hil-3
Tipus d'estada	PFC
Descripció	**Project on Digital Multimedia Broadcasting** Based on the Europeen DAB Standard Eureke 147 improved data transmission capabilities should be evaluated, implemented an combined with applications like Dataservices (Broadcast Web Side) or video transmissions based on the H.264 Standard. Several sub-projects are available. **Subject 3:** *(one student):* Realise a PDA application for a DMB Video reception. A DAB receiver has to be connected over the SDIO interface. A driver for this interface has to be developed or integrated if available elsewhere. The RS decoder from sub-project 2 has to be implemented together with a H.264 video decoder. A GUI to control the receiver and the decoder has to be implemented.
Durada	Starting time: February 2005 Duration: 6 months
Requisits	
Nombre de places	1

BOSCH (Alemania-Hildesheim)

Codi	D Bosch Hil-4
Tipus d'estada	PFC

Descripció	**Comparative Analysis of various Front-end Concepts for a digital Long-, Medium- and Shortwave-Receiver (DRM)** Currently a new digital transmission standard for the long-, medium- and shortwave bands, called Digital Radio Mondiale (http://www.drm.org/) is under development. Due to its very bandwidth efficient frequency utilisation and the COFDM transmission scheme compared to the analogue system new requirements are imposed to the RF front-end. For example the multi carrier system COFDM requires a better phase noise performance of the PLL as the analogue system. While in the analogue case -25 dBc/Hz are sufficient, the COFDM scheme needs minimum -60dBc/Hz at 50 Hz separation from the carrier. Furthermore the channel filters need a higher selectivity due to the use of digital filtering with its steeper grades. Furthermore with the introduction of a new system it is highly desirable to allow for an automatic frequency switch to alternative frequencies when reception is getting bad as it is with FM-RDS. This requires the use of a very fast PLL, which can jump over the whole frequency range from 150 kHz (2 MHz) up to 30 MHz in the extreme case within a quite short time period. The figure below shows the block diagram of a typical receiver.  There are 3 front-ends (S2-S8) with different concepts available, whose performance shall be compared to each other: a consumer receiver as reference, an development by our own and an evaluation board for direct sampling of the antenna input signal. For analysing the system a combined hard- and software simulation system is built-up for which the receiver functionality has to be implemented in the programming language C. The DRM system is quite similar to the digital terrestrial television standard DVB-T. The OFDM carriers are modulated with QAM 16 or 64. Channel coding is done realised with a multilevel coder. For audio coding the compared to MP3-Pro improved and more efficient AAC+ audio coding from the MPEG-4 family is used. As the carriers have to be demodulated coherently pilots are scattered over the symbols for channel estimation and synchronisation. Signalling of the transmission parameter is realised by two integrated data channels, the so-called Fast Access Channel and the Service Description Channel. **Task 1)** *Focus on performance comparison* The system performance has to be evaluated by measurements with the 4 front-ends and the results have to be compared to each other. Measurement descriptions and typical requirements for the various parameters are available.
Durada	Starting time: February 2005 Duration: 6 months
Requisits	Some hardware know how (ideally radio amateur), experience in RF measurements
Nombre de places	1

BOSCH (Alemania-Hildesheim)

Codi	D Bosch Hil-5
Tipus d'estada	PFC
Descripció	**Implementation of the Receiver Software for a combined Hard- and Software Simulation Chain for the DRM System** See description for D Bosch Hil-4. **Task 2)** *Focus on receiver software* A HW/SW simulation chain for the DRM system has to be completed. The transmitter or encoder, respectively,

	with a channel simulator including the required hardware are available. Via the above mentioned front-ends the digital signals are read with a dedicated I/O-board into an PC for the decoding process. The channel decoder already comprises all necessary modules like FFT, multilevel (Viterbi)-decoder, synchronisation, channel estimation and a graphical user interface. According to the system specification some modules have to be extended e.g. for using double channel bandwidth or enhanced features like an alternative frequency data base should be added. Depending on skills also implementation on a DSP can be envisaged.
Durada	Starting time: February 2005 Duration: 6 months
Requisits	good C programming skills, preferably familiar with Visual C programming environment, good knowledge in communication technologies especially signal processing algorithms like FFT, digital filtering, QAM modulation.
Nombre de places	1

BOSCH (Alemania-Hildesheim)

Codi	D Bosch Hil-6
Tipus d'estada	INTERNSHIP
Descripció	**Data Exchange between Driver Information System (DIS) and Mobile Devices** Future driver information systems will be connected to local devices and remote servers through different networks (e.g. Bluetooth, WLAN, GPRS, UMTS). In the period of this practical training applications for connecting such devices with the DIS should be realized. Main focus is on the exchange of "PIM" Data (e.g. addresses) to automatically include external data base entries within the car DIS Key words: Data synchronization, Sync protocols (e.g. SyncML), XML, compression, HMI, wireless transmission, Bluetooth, OBEX, Flash Memory, Database, Server Other applications (e.g. due to students suggestions) are possible as well.
Durada	Starting time: February 2005 Duration: 6 months
Requisits	Good intermediate examination, Good Java and/or C++ knowledge
Nombre de places	1

BOSCH (Alemania-Hildesheim)

Codi	D Bosch Hil-7
Tipus d'estada	INTERNSHIP
Descripció	**Input-/output- technologies** The man-machine interface is an important distinction feature between different car manufacturers. Due to the variety of the functions offered and the increasing number of versions of the systems in the motor vehicle, new input-/output-technologies (Head Up Display etc.) represent an important contribution to the Usability. You would do a study on this topic concerning input-/output-technologies in consumer electronics with regard to usability in an automobile. The aim of this study is to evaluate available technologies and trends and point out those potentially interesting. A report shall arise to the "overview and trends" of input-/output-technologies in which a judgment is existing on the end.
Durada	Starting time: February 2005 (as soon as possible)
Requisits	You follow your university or fold higher education of the direction electrical engineering, computer science or technical computer science with good results. In addition, you have knowledge in the area of man-machine communication and you already have some experience with internet inquiry. Additional technical knowledge would desirable to perhaps build up demonstration setups. We presuppose openness, confidence, very good knowledge of English in word and document and reliability. In case the necessity arises, work on the topic could subsequently be continued as a master thesis.
Nombre de places	1

inici de pàgina

PHILLIPS

PHILLIPS (Alemania-Aachen)

Codi	D Philips Aac-7
Tipus d'estada	PFC
Descripció	**Channel management for wireless body sensor networks** We are pursuing the vision of a cable-free patient where care givers in hospitals can dynamically form a body area network tailored to the individual needs of the patient by just placing smart wireless medical nodes for acquiring, processing, storing, transmitting, and displaying vital signs (e.g. ECG, blood pressure, oxygen saturation) at the patient's body or in the immediate vicinity of the patient. To avoid interference between body sensor networks of different patients that are in range of each other and wireless LANs, and to exploit the available frequency spectrum in the best way, concepts for coordinated channel management are needed. Channel management is responsible for assigning channels to body sensor at network setup time and to reassign channels due to changing the location. The developed concepts should be implemented on our wireless sensor network platform as proof-of-concept.
Durada	6 months, beginning on March 2005 (or later)
Requisits	- Experience in programming resource-constrained systems (e.g. programming of Atmel microcontroller in C, AVR studio) - Background in wireless communications (e.g. IEEE 802.15.4) - Interest in distributed systems, wireless ad-hoc networking, embedded systems - Fluent English in speaking and writing
Nombre de places	1

PHILLIPS (Alemania-Aachen)

Codi	D Philips Aac-8
Tipus d'estada	PFC
Descripció	**Automatic patient identification for cableless patient** Modern patient monitoring systems in hospitals are going to deploy wireless technology: To have better and more efficient care giving, doctors want to get rid of the cables, which are currently used to connect monitoring devices to the patient. We achieve this by developing a wireless sensor network: different sensors can be easily attached to a patient, and jointly gather the required vital signs and transmit the data wireless. To avoid hospital errors and to ensure patient safety, we are going to deploy automatic patient identification based on an 'Active Digital Aura', being developed at Philips Research. When attached to a patient, each wireless sensor node can discover the patient identification, and can this way be automatically assigned to the right patient. This master thesis bases on our new wireless sensor systems, which are directly coupled with an identification module. Main task of this master thesis is to identify, specify and develop the sensor network communication protocols that enable the required automatic identification. This comprises internal communication between the modules of the individual sensor node as well as communication between different autonomous nodes. Objectives: - Requirements analysis on communication protocols for Digital Aura-based identification in sensor networks. - Design and implementation of a protocol architecture for automatic identification - Develop test scenarios on measuring reliability of identification - Build demonstrator showing the developed concepts at one application
Durada	6 months, beginning on March 2005 (or later)
Requisits	- Background in wireless networking and communication protocols - Interest in mobile distributed systems and medical applications - Experience in programming resource-constrained systems(e.g. programming of Atmel microcontroller in C, AVR studio) - Knowledge in assembler programming, preferably also practical experience - Fluent English in speaking and writing
Nombre de places	1

PHILLIPS (Alemania-Aachen)

Codi	D Philips Aac-9
Tipus d'estada	PFC
Descripció	**Wireless power for portable devices** Charging the battery of portable devices like mobile phones, PDAs or music players today requires individual

	charging devices with often non-compatible plug connections. Inductive charging solutions may simplify the connection to the charging circuit and might also lead to a standardized interface suitable for a number of different devices. The diploma thesis should investigate and summarize existing or proposed solutions and benchmark them with respect to efficiency, necessary technological effort, ease of use and electromagnetic interference. A demonstrator circuit should be made to show the best concept.
Durada	6 months, beginning on March 2005 (or later)
Requisits	- good knowledge in power electronics, magnetic design, and in circuit design - practical skills to measure and to set up circuits - familiar with a circuit simulation tool like Pspice and mathematic tools like MathCad. - high motivation - fluent English in speaking and writing.
Nombre de places	1

PHILLIPS (Alemania-Aachen)

Codi	D Philips Aac-10
Tipus d'estada	PFC
Descripció	**Reliable Communication Protocols for Active Identification** New electronic identification solutions are strongly required in hospitals to avoid misidentification of patients and to simplify care-giving procedures. This project aims at realizing reliable communication protocols for 'Active Digital Aura' in a multi-user environment. Patients and clinicians are equipped with electronic tags, which contain unique identifiers. Via our 'Active Digital Aura', a tag can communicate with medical devices that are linked to the person. This technology will be used for automatic identification for easy and safe access to patient data, as well as for safe medical data ransfer. To achieve this, highly reliable interaction protocols are required to meet the safety demands of the medical domain. The task of the master thesis is to develop a protocol suite, covering reliable link- identification-, and data-transfer protocols for 'Active Digital Aura' in a multi-user environment. Objectives: - Requirements analysis on reliability of communication - Develop test scenarios on measuring and verifying communication reliability - Design and implementation of a protocol architecture for reliable communication - Protocol enhancement for medical data transfer, in addition to identification - Build demonstrator showing the developed concepts at one application
Durada	6 months, beginning on March 2005 (or later)
Requisits	- Background in wireless networking and communication protocols, - Interest in mobile distributed systems and medical applications, - Experience in programming, at least in one of Java, C++, C#, - Knowledge in assembler programming, preferably also practical experience, - Fluent English in speaking and writing.
Nombre de places	1

PHILLIPS (Alemania-Aachen)

Codi	D Philips Aac-11
Tipus d'estada	PFC
Descripció	**Personal Healthcare monitoring** Personal Healthcare (PHC) is of growing importance, ranging from fitness up to monitoring specific health risks. Applications like home health monitoring increase quality of care as people can stay at home with risks that today demand a stay in hospital. This project will develop a home health management system for multiparameter health monitoring. The system will be capable to collect measurements of one or more health parameters (ECG, Blood pressure, weight, temperature, etc.) that a user takes with his wireless medical devices. In addition to the measurement data, the system will detect and store the context in which each measurement was done (e.g. who used the sensor, where was the measurement done, when was the medication taken). The user will get feedback from the system via a monitor or a portable device. The task of the master thesis is to develop communication protocols and context management for such a home monitoring system, and apply this for a concrete medical scenario, e.g. blood pressure -measurement and -management. Objectives: - Describe application scenarios for home health monitoring system - Specify architecture for personal home health monitoring system, covering interface to health

	measurements, context recording, user interaction. - Design and implementation of a measurement recording function, in combination with identification and positioning. - Build demonstrator showing the developed concepts at one application
Durada	6 months, beginning on March 2005 (or later)
Requisits	- Background in wireless networking and communication protocols, - Interest in mobile distributed systems and medical applications, - Experience in programming, at least in one of Java, C++, C#; - Fluent English in speaking and writing.
Nonmbre de places	1

PHILLIPS (Alemania-Aachen)

Codi	D Philips Aac-12
Tipus d'estada	PFC
Descripció	**Adaptive Routing for mobile Ad-hoc networks** Research into fourth generation wireless networks is being focused on mobile ad-hoc networks (MANETs), which are characterised by their autonomous nature, not relying on any pre-existing infrastructure. MANETs are established in an on-demand fashion, and each device in the network can join, leave and change its position dynamically. Due to the limited transmission range of devices in these networks, multi-hop routing is used to allow two devices to communicate when not in immediate range of each other, meaning that intermediate stations are used to forward information from source to destination. Many routing algorithms for ad-hoc networks have been developed and some have reached Request for Comment (RFC) status. At the present time, there are no routing protocol standards. The most widely fielded wireless local area network (WLAN) products on the market today are based on the IEEE 802.11 standard. In particular, the IEEE 802.11a,g,p standards offer several raw data rates of up to 54 Mbps, supporting high data rate applications. However, many of the ad-hoc network routing protocols do not consider the multi-rate nature present in IEEE 802.11 systems, deeming all links in a network to be equal. This decreases the performance of the routing algorithm in terms of throughput and delay. As there is an increasing demand in high bandwidth and low delay video applications, requiring some Quality of Service (QoS) support, a routing algorithm needs to be developed to consider multi-rate, in turn supporting soft QoS in ad-hoc networks.
Durada	6 months, beginning on March 2005 (or later)
Requisits	- Electrical engineer with basic knowledge in communications - Basic knowledge of C/C++ language programming and event-driven simulators like Opnet - Fair knowledge of English language
Nombre de places	1

PHILLIPS (Alemania-Aachen)

Codi	D Philips Aac-13
Tipus d'estada	PFC
Descripció	**Simulation modelling for in-car communication systems** The interconnection of in-car sub-networks requires gateways that can handle different types of connections and communication protocols. A simulation model of such a gateway is needed to investigate functionality and performance. The work will contain the realization of the gateway simulation model whereby different aspects can be investigated, like the abstraction from the protocols towards an internal protocol independent data-format, the effect of task scheduling on the latency, the analysis of performance bottlenecks, the analysis of potential unreliable mechanisms.
Durada	6 months, beginning on March 2005 (or later)
Requisits	- c++ - operating systems - communication protocols - English
Nombre de places	1

PHILLIPS (Alemania-Aachen)

Codi	D Philips Aac-14
Tipus d'estada	PFC
Descripció	**Prototype implementation of an inter-vehicle local danger warning system** The candidate will set up an IEEE 802.11 based development environment for testing and performance evaluation of ad-hoc networking algorithms to be applied for local danger warning in car-to-car communication. If the hardware platform permits, the algorithms touch the MAC layer by providing tuning options for optimization of the communication parameters relevant to the outdoor propagation characteristics. The main focus is on network protocols for geocast addressing, topology management by means of beacons, message prioritization and queueing, allowing the simultaneous operation of a control channel for safety and management related information as well as a service channel for lower priority network traffic. A number of these algorithms have been pre-studied and described in SDL specification language, and need to be proven functionally correct in a Laboratory environment. This work is part of the large European Integrated project PREVENT.
Durada	6 months, beginning on March 2005 (or later)
Requisits	- good programming skills in c++; visual c++ knowledge - linux or windows developing environment - Fluent English in speaking and writing, German (optional)
Nombre de places	1

PHILLIPS (Alemania-Aachen)

Codi	D Philips Aac-15
Tipus d'estada	PFC
Descripció	**Clustering in vehicular ad-hoc networks** Vehicle clustering according to application rather than geographic location will allow different inter-vehicle applications to run at the same time, where every application may set up its own virtual cluster in order to optimize the exchange of relevant information. The main rationale for this approach are the requirements for cooperative systems, which need coordination and synchronization of car movements in a safety critical manner. In other words, the timing and sequence of messages, and the consistency thereof at all participating nodes is of crucial importance. Simple broadcast messages or unorganized exchange of unicast messages would not be reliable enough, and reaching a stable state might simply take too long time. This concept has to be developed with particular focus on the demands from mobility of the individual clusterheads and subscribing nodes as well as the effects from overlapping clusters and nodes being subscribed to more than one application. A prioritization scheme has to be developed giving preferred medium access to the safety relevant applications. The candidate will also study the typical cluster issues, like splitting and merging in this highly dynamic environment. After aligning the topic regarding the typical MANET scenarios and approaches, the distributed algorithms will be identified, prioritized, and implemented in SDL language.
Durada	6 months, beginning on March 2005 (or later)
Requisits	- Mobile ad-hoc networks architecture, - radio communications, - network simulation, - C++ - (helpful: SDL) - Fluent English in speaking and writing, German (optional)
Nombre de places	1

PHILLIPS (Alemania-Aachen)

Codi	D Philips Aac-16
Tipus d'estada	PFC
Descripció	**Synchronization in ad-hoc vehicle networks including road side units** Aim of the work is to study, implement and evaluate a solution for distributed synchronization of the nodes in an ad-hoc networks. Primary use of synchronization is to enable reliable operation of the mobile nodes in multiple channels; other purposes include MAC enhancement and resources optimization. Main challenges are to implement a solution that is compatible with the requirements of our inter-vehicles communication scenario: - compatible with high mobility of the nodes. - suitable to operate in multiple channels and under Dynamic Frequency Selection. - able to switch automatically between from distributed mode to master mode when a fixed road side master unit is detected.

	The algorithm will be implemented in SDL specification language and tested in our mobile ad-hoc network simulator. This work is part of the large European Integrated project PREVENT.
Durada	6 months, beginning on March 2005 (or later)
Requisits	- analytical and creative thinking - strong background in ad-hoc networking. - good knowledge of programming languages (c/c++) - good telecommunication background - helpful: network simulation using OPNET, ns2, or SDL - Fluent English in speaking and writing, German (optional)
Nombre de places	1

PHILLIPS (Alemania-Aachen)

Codi	D Philips Aac-17
Tipus d'estada	PFC
Descripció	**Message dissemination for inter-vehicle local danger warning** During market introduction of vehicular local danger warning systems, the penetration ratio of equipped vehicles is relatively low, the road/vehicle network is fragmented either because of a variable vehicle speeds or due to specific road topologies, leaving a high probability that no receiver of the warning is available. This thesis aims at methods to ensure stochastically reliable and scalable broadcast in mobile ad hoc networks in the context of Inter-Vehicle Communication. Various strategy for this "confirmed delivery" of broadcasted warning messages will be analzyed, based for example on geocasting and restrictive flooding techniques. Keeping the bandwidth retransmitted messages to a minimum, new algorithms are explored that either: - guarantee the delivery of the message to equipped vehicles with a certain range (target zone) and for a specified time to live, - or based on road geometry and navigation/GPS data multi-hop the data to a target destination The algorithm will be implemented in SDL specification language and tested in our mobile ad-hoc network simulator. This work is part of the large European Integrated project PREVENT.
Durada	6 months, beginning on March 2005 (or later)
Requisits	- Mobile ad-hoc networks architecture, - radio communications, - network simulation, - C++ - (helpful: SDL) - Fluent English in speaking and writing, German (optional)
Nombre de places	1

PHILLIPS (Alemania-Aachen)

Codi	D Philips Aac-18
Tipus d'estada	PFC
Descripció	**A Precision Low-EMC Multi-Level Power Converter with High Efficiency** Modern electronic equipment for medical applications requires ever increased levels of sophisticated power supply solutions. This not only comprises the quest for the highest possible degree of conversion efficiency while at the same time employing a smart strategy for multiple outputs but also mandates a low impact of the overall design regarding EMC issues. Suitable low-voltage DC converter architectures (less than 50 Watts) should be investigated as an integral part of a larger system, analysed and rated. The best suited design should then be implemented and tested.
Durada	6 months, beginning on March 2005 (or later)
Requisits	- Interest in advanced medical equipment, with special attention to power conversion and distribution strategies, and low-noise topics - Working knowledge of circuit simulation (e.g. SPICE) and of practical electronics - Background in modern power electronics and system theory - Ideally background in programmable logic - Fluent English in speaking and writing
Nombre de places	1

PHILLIPS (Alemania-Aachen)

Codi	D Philips Aac-19
Tipus d'estada	PFC
Descripció	**Wireless power for portable devices** Charging the battery of portable devices like mobile phones, PDAs or music players today requires individual charging devices with often non-compatible plug connections. Inductive charging solutions may simplify the connection to the charging circuit and might also lead to a standardized interface suitable for a number of different devices. The diploma thesis should investigate and summarize existing or proposed solutions and benchmark them with respect to efficiency, necessary technological effort , ease of use and electromagnetic interference. A demonstrator circuit should be made to show the best concept.
Durada	6 months, beginning on February/March 2005
Requisits	- good knowledge in power electronics, magnetic design, and in circuit design - practical skills to measure and to set up circuits - familiar with a circuit simulation tool like Pspice and mathematic tools like MathCad - high motivation and good English or German skills
Nombre de places	1

PHILLIPS (Alemania-Aachen)

Codi	D Philips Aac-20
Tipus d'estada	PFC
Descripció	**Body power network** Charging the battery of portable devices like mobile phones, PDAs or music players today requires individual charging devices with often non-compatible plug connections. Inductive charging solutions may simplify the connection to the charging circuit and might also lead to a standardized interface suitable for a number of different devices. The diploma thesis should investigate and summarize existing or proposed solutions and benchmark them with respect to efficiency, necessary technological effort , ease of use and electromagnetic interference. A demonstrator circuit should be made to show the best concept.
Durada	6 months, beginning on February/March 2005
Requisits	- good knowledge in power electronics, magnetic design, and in circuit design - practical skills to measure and to set up circuits - familiar with a circuit simulation tool like Pspice and mathematic tools like MathCad - high motivation and good English or German skills
Nombre de places	1

PHILLIPS (Alemania-Aachen)

Codi	D Philips Aac-21
Tipus d'estada	PFC
Descripció	**Contact less bio-impedance sensing** Inductive measurement of the bio-impedance can be used to contactlessly detect a number of vital parameters of a human body, such as heart rate, heart volume change, tissue water and fat content, non-invasive glucose measurement and others. The diploma thesis aims for improving this method. With support of the supervisor existing experimental setups should be improved with respect to sensitivity and robustness against external disturbances by using new sensor arrangements and/or improved signal processing algorithms.
Durada	6 months, beginning on February/March 2005
Requisits	- good knowledge in magnetic design, and in circuit design - practical skills to measure and to set up circuits - circuit simulation tool like Pspice and mathematic tools like MathCad and FEM programs - high motivation and good English or German skills
Nombre de places	1

PHILLIPS (Alemania-Aachen)

Codi	D Philips Aac-22
Tipus d'estada	PFC
Descripció	**Red, Green and Blue LED-based White Light Source** Combining red, green and blue (RGB) LEDs can provide a compact white light source with unique features such as instant colour variability. However, the implementation of an RGB-LED light source has numerous practical issues such as sensor placement, LED driving, control design and stability with temperature and time. In this project, a dSPACE rapid control prototyping system shall be used to investigate control, drive and sensing issues for an available RGB-LED light engine. Control algorithms have to be implemented in the MATLAB / Simulink / dSPACE environment. Some modifications shall be made to existing driver and sensor boards.
Durada	6 months, beginning on February/March 2005
Requisits	- basic knowledge in control, power electronics and sensors - familiar with MATLAB and Simulink - practical skills to measure and to set up circuits - high motivation and good English skills
Nombre de places	1

PHILLIPS (Alemania-Aachen)

Codi	D Philips Aac-23
Tipus d'estada	PFC
Descripció	**Ultra thin mains input filter for flat LCD monitors** Consumer devices which are mains driven need a mains input filter to suppress disturbances generated by the power supply. To integrate those filters with the power supply behind the screen of a flat LCD monitor ultra thin components will be required. The goal of this project is to reduce the thickness of these filter components. A promising concept for ultra thin circuits is the planar integration into printed circuit board. The technology for those circuits is being developed in our research group and first examples for power converters are shown. In this project the potential of this technology for the use in filters shall be evaluated and demonstrated and compared to a conventional solution. This work will comprise the simulation of circuits (PSPICE) and devices (electromagnetic finite element models) and building and evaluating prototypes.
Durada	6 months, beginning on February/March 2005
Requisits	- circuit design - basic knowledge on electromagnetics - hardware experience in the field of (power) electronics desirable - knowledge of PSPICE desirable - knowledge of electromagnetic finite element modelling desirable - high motivation and good English or German skills
Nombre de places	1

PHILLIPS (Alemania-Aachen)

Codi	D Philips Aac-24
Tipus d'estada	PFC
Descripció	**Investigation of a new SMPS topology** Modern advanced digital circuits require high currents at low voltages (e.g. 80A/0.9V) within narrow limits. They typically have a dedicated power supply in their proximity, called "Point of Load Converter" (PoL). These consist nowadays of a synchronous buck converter. However, efficiency requirements and space constraints of the application justify the search for better alternatives. Philips Semiconductors is one leading supplier for state-of-the-art TrenchMOS transistors, among others for this application. The Philips Research Lab in Aachen has intensive knowledge of those circuits and systems. Subject of this diploma thesis will be to study a certain alternative switch-mode topology. This includes the theoretical description, PSpice simulations, the building of a prototype and to tune and measure the

	efficiency of this.
Durada	6 months, beginning on February/March 2005
Requisits	- good knowledge in power electronics, the application of MOSFETs, and in circuit design - practical skills to measure and to set up circuits - familiar with a circuit simulation tool like Pspice - high motivation and good English skills
Nombre de places	1

PHILLIPS (Alemania-Aachen)

Codi	D Philips Aac-25
Tipus d'estada	PFC
Descripció	**Oscillations in high current automotive circuits** In the car of the future, high current power electronics will drive functions like electric braking, electric power steering, or active suspension systems. This leads to high current (e.g.400A/12V) switch-mode inverters that are equipped with MOSFET switches. Philips Semiconductors is one leading supplier for state-of-the-art TrenchMOS transistors, among others for the automotive industry. To achieve very high current capability, one preferred option is to connect several MOSFETs in parallel, in order to share the load current. However, a system of parallel connected MOSFETs can have a tendency to build up parasitic oscillations. Subject of this diploma thesis would be to do a small literature study, to simulate a few applications, to characterise MOSFETs, and to measure the inclination to oscillations in a laboratory set-up. The aim is to identify and assess the parameters that support or suppress these parasitic oscillations. Final goal is to derive design guidelines for oscillation-free applications.
Durada	6 months, beginning on February/March 2005
Requisits	- good knowledge in power electronics, the application of MOSFETs, and in circuit design - practical skills to measure and to set up circuits - familiar with a circuit simulation tool like Pspice - high motivation and good English skills
Nombre de places	1

inici de pàgina

Blaupunkt GmbH

Blaupunkt GmbH (Alemania-Hildesheim)

Codi	D BLAU Hil-1
Tipus d'estda	INTERNSHIP
Descripció	**Call for Practices positions** We belong to the CM-PS/ESW division of the firm Blaupunkt GmbH. We develop software for devices wich are used in commercial vehicles. Basic areas are Coach-, Train- and Truck - entertainment, Rear Seat Entertainment, Fleetmanagment and Telematics. More information can be found at http://www.blaupunkt-professional-systems.com. We develop basically using the C, C++ programming language. We also have some additional tools for testing and debugging our work. We need students interested to work in one of the following areas: 1. Design and implementation of * communication tools * telematic services (GPS) * GSM/GPRS - data transfer procedures * Software/Hardware testing tools * car navigation systems 2. Improvement of exisiting HMI systems 3. Tests of Hardware and Software 4. Data services via Digital Audio Broadcast (DAB)
Durada	The duration of the stay may vary between one and four months.
Requisits	We expect programming skills in any language and a good english or german level.

Nombre de places	1

inici de pàgina

DLR

DLR (Alemania-Munich)

Codi	D DLR Mun-4
Tipus d'estada	PFC
Descripció	**Synchronisation Techniques for Mobile Satellite Communications at Ku/Ka Band** The aim of this work is to study robust digital synchronisation schemes for mobile satellite communications at Ku/Ka band. Due to the nearly on-off channel behaviour in land-mobile and railway scenarios, frequent signal losses are to be expected. Consequently, latencies due to resynchronisation time may severely limit the performance of many fading mitigation techniques, such as FEC strategies combined with long interleavers. Furthermore, even in LOS condition, some powerful coding schemes, such as Turbo Codes, have a high sensitivity to residual synchronisation errors, thus limiting the effective usage of low coderates. The student work will mainly consist in a literature review of available algorithms, selection of the most suitable candidates for the above described mobile scenarios, and performance assessment by means of SW simulations.
Durada	6 months, beginning on February 2005 (as soon as possible)
Requisits	- Basic background of communications systems - Fluency in English - Some knowledge/background in digital synchronization techniques is appreciated but not mandatory - Knowledge of Matlab® is also helpful
Nombre de places	1

inici de pàgina