ANR
AGENCE NATIONALE DE LA RECHERCHE

Presentation of the funded projects in 2010 for the « Contents and Interactions » program

AFAQ
ISO 9001
SELECTION

Project title	**3D_COMFORT& ACCEPTANCE :** 3D COMFORT & ACCEPTANCE

Abstract

3D is becoming a real challenge in the futur of digital entertainment. The 3D digital cinema market is growing fast, but 3D TV, and 3D video games are going to be two other major market in a near future. The James Cameron's Movie has been the real start for the 3D content creation, with an audience that went beyond unexpected figures. Movie Theatres are moving forward in term of diversification showing alternative 3D contents (concerts, sports,...) and 3D commercials. In term of content, some movie directors starts thinking of 2D-3D conversion in order to provide new 3D content from existing ones (Star Wars for Georges Lucas, Oceans for Jacques Perrin). Creating 3D content will be soon a tremendous bussiness. The 3D content creation has to be new and highly qualitative in order to draw an important and regular audience. It has to be attractive enough to convince people to wear glasses all along the various content, even at home. An uncorfortable content would have a very negative impact onto the market and the early development of that new technologie. It is necessary to start studying scientifically and medically the 3D visual effects of various 3D content on the various available and future displays (TV 3D, PCs and movie screen). Short contents will surely present very strong 3D effects since commercial will use the hyper-stereoscopy (3D effect in front of the screen) to provide the highest cognitive impact as possible. But, every brand will want to have the strongest effect. On the other hand, 2D-3D conversion, if not done properly will induce residual and uncomfortable errors, it might even spoil the aesthetic of the remastered content. These two problems might slow down the acceptance of 3D by the audience. It's the right time to take care of these issues in order to participate to the improvement of the 3D market economy. 3D_Comfort&Acceptance associates various national leaders in order to better understand the 3D vision, and how to create a label of quality and recommandation that will help 3D brodcasters, 3D producers and 3D movie director to provide qualitative 3D contents to the audience on cinema, TV and PCs.

Partners	3DLIZED Institut Telecom - Telecom Bretagne Eyes Triple Shut Institut Telecom - Laboratoire de Traitement de l'Information Médicale Fédération de l'Industrie du Cinéma, de l'audiovisuel et du Multimédia (FICAM) DOREMI Technologies
Coordinator	Patrick ZUCCHETTA – 3dlized patrickz@3dlized.com
ANR funding	860 700 €
Starting date and duration	January 2011 - 36 months
Reference	ANR-10-CORD-022
Cluster label	Cap Digital Paris-Région et Images & Réseaux

Project title	ADAM2 : Distributed Architecture and Multiple Multimedia Services

Abstract

The development of services based on distributed architectures is claiming its place among the most important evolutions of the Internet and communication networks in general. This project aims at developing an in-depth knowledge of the issues and questions raised by such architectures in terms of uses, technologies, economic models, rights and norms. More specifically, the project focuses on systems based on peer-to-peer (P2P) technologies, in two different cases: Internet-based P2P services for a variety of uses, including information search, storage, sharing or communication; and mobile P2P networks aiming at harnessing contextual resources in communicative environments, in a perspective of ubiquitous computing or resource sharing among co-localised individuals.

The project will seek to answer three main sets of questions: - What distribution of competences among service providers, network operators and users are taking shape in and by means of such applications? An analysis of the forms of engagement by developers, users and other actors involved in the implementation of services will contribute to qualify their technical and economic viability, as well as the take on "classic" questions such as data security or privacy. - What collective dynamics are taking place by means of P2P? These services are suggesting the possibility of new relations between local and global, in a variety of configurations. An exploration of issues unobserved insofar will be conducted, in terms of articulation between individual and collective, in spaces defined in both networked and geographical terms. - What legal issues are raised by P2P-based configurations, and what reliable solutions for regulation, vis-à-vis property and access rights, are foreseeable? We will seek to identify and qualify possible redefinitions of the notion of "author", reconfigurations of users' rights, and shifts in the frontier between private and public uses.

The program will be implemented by a consortium of three laboratories, well- known for their research on science and technology: CSI, CERSA and the department of Economic and Social Sciences at Télécom ParisTech. A partnership with industry will not be directly involved, but the consortium will operate in close contact with researchers, entrepreneurs and industry in the concerned domain, in order to secure efficient result dissemination, vis-à-vis the industrial and political sphere. The research program will investigate four

dimensions: - an initial, transversal phase of inventory of projects and innovations in the domain of distributed architectures, so as to propose a cartography and identify associated social, economic and legal issues. - an analysis of the dynamics of innovation in P2P projects: carried on in the two domains of Internet services and mobile networks, it aims at producing 6 monographs, one per project, retracing processes of technology shaping and anticipation of uses. - a series of investigations among users of such services, also involving both domains, aiming at understanding the construction of uses of associated community dynamics. - a detailed study of the set of legal/juridical issues related to these architectures. The project will last 36 months, and will include a number of communicative activities targeting not only the academic community, but also the public, political powers, and service developers.

A final phase of dissemination, in the last 6 months, will lead to an international colloquium stimulating debate on the research's results in a larger framework.

Partners	Armines - Centre de sociologie de l'innovation INSTITUT TELECOM - Telecom Paristech CNRS DR1 - CERSA
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ANR funding	642 185 €
Starting date and duration	November 2010 - 42 months
Reference	ANR-10-CORD-004
Cluster label	Cap Digital Paris-Région

Project title	**CAAS :** Contextual Analysis and adaptive Search

Abstract

Information Retrieval Systems (IRS) aim at retrieving information that meet a user's need expressed in a query. Retrieving relevant information to a query implies a two step process: off line, the system indexes documents, the system computes the similarity between the user's query and the document representations (indexing terms) to retrieve the most similar documents. Current IRS, e.g. search engines on the web are general search tools implementing the same mechanisms and the same methods of data processing and matching, whatever the context of the search, the user, the type of information needs, or information usage are. The assumption of the project CAAS is that context could improve the performances of the IRS, explicating certain elements of the information retrieval. The contextual aspect refers to tacit or explicit knowledge concerning the intentions of users, the environment of users and the system itself. The fundamental scientific issues that we can quote are:

. Control of the variety of the contexts: To raise this issue, we will have to define models making it possible to represent the various aspects of the context in IR. It is also a question of studying the variety of the treatments and their adequacy with the variety of the contexts.

. Training of the contexts: Modelling context is not an end in itself. The system must be able to have the intelligence to decide the most adequate technologies compared to a given context, i.e.: to adapt the methods of IR to the context

. Recognize a context: when a context comes across, the system has to detect it among the leant contexts in order to be able to decide which method it should apply.

To tackle these challenges, CAAS will consider the various aspects that may impact the IR process first as independently as possible, then considering the cross-effects. We will focus on the following contextual elements:

. the users' expectation and users' queries

. the documents

. the system components For each of them, we will consider various collections and will qualify them, then we will analyse them deeply in the aim of extracting models and behaviour. Once each contextual element will be analysed, we will consider the cross effect. For example, one of the results could be that query reformulation using relevance feedback is useful when the query contains proper nouns. We will consider both benchmark collections from international program and more realistic collections from companies. CAAS also aims at developing modules from our findings. These modules will be integrated in IR platforms so that they could be re-used as components of

complete IR systems. Because analysis and modelling is the core of the project, the partners are all academics. However companies are largely considered: first one major IR web search engine will provide us with query logs as well as a smaller company. Companies will also be considered in the spreading results activities: we will contact different companies in order to show our finding and either will suggest customizing the developed modules for them or transferring the technologies. For example, one application is to suggest adds to be associated to users' queries in a web site. To tackle the challenges, the consortium is composed of two institutes in computer sciences, both specialists in IR, but with complementary skills. LIA (Laboratoire Informatique Avignon) works on Question Answering problems, while IRIT (Institut de Recherche en Informatique de Toulouse) is more specialists in Adhoc retrieval and detecting novelty. IRIT works in close relation with IMT (Institut de Mathématique de Toulouse) and for this project with the Statistique et Probabilité group. Even if IMT does not appear as a partner they will be working in this project. CLLE (Cognition, Langues, Langage, Ergonomie) is partner of this project regarding their linguistic skills and past work in IR and natural language processing.

Partners	Université Paul Sabatier / Toulouse III – Institut de Recherche en Informatique de Toulouse (IRIT) Université d'Avignon et des Pays du Vaucluse – Laboratoire Informatique Avignon (LIA) CNRS - Cognition, Langues, Langage, Ergonomie (CLLE)
Coordinator	Josiane MOTHE – IRIT mothe@irit.fr
ANR funding	438 568 €
Starting date and duration	December 2010 - 42 months
Reference	ANR-10-CORD-001
Cluster label	SCS (Solutions Communicantes Sécurisées) et Aerospace Valley

Project title	ChronoLines : Generating Visual Event-based Chronologies

Abstract

The main objective of our project is the generation of innovative interfaces to display information according to temporal criteria. Although our goal is closed to applications such as timelines, unlike the latter, we plan to extract and use temporal informations from the texts in order to enrich the foreseen user interfaces. The manipulated objects, called « Event-based Chronologies », prepared from semi-automated position-finding of events and of datative temporal expressions in essentially "breaking news" type texts (written in French and in English), will be associated with visualisation (multimedia) widgets enabling to visualise events associated with a "mediatic event" in chronological order; wherein said event acts somehow as the "trigger" for information search so that said event is presented relative to a context forming the collection of events which may be associated therewith. AFP currently diffuses numerous Event-based Chronologies over a wide range of mediatic events via its information departments. They are currently handled manually, by copying breaking news or documentation transmitted previously and are purely textual (since provided for the press). There are hence unsuited to multimedia, Internet and mobile usage, which has now become the rule. The purpose of this project is to provide a solution to this situation by setting ourselves the global following objectives:

1. Assist semi-automatic construction of these Event-based Chronologies by using NLP (natural language processing) techniques;

2. View and browse multimedia Event-based Chrononlogies by using visualisation technologies.

Our working programme is hence organised quite simply in the light of both these objectives. More precisely, and this the original aspect of our approach from a conceptual angle as well as regards the applications contemplated, we combine items 1. and 2. while suggesting as follows:

1'. on the one hand taking into account the problematic of different levels of temporal referencing, associated with the different types of enunciative and modal managements which can be identified within the texts;

2'. and on the other hand to contemplate the development of tools enabling to anchor events along a "multilevel" temporal visualisation scale. In the first axis, the aim is to generate, in relation to a request (the name of an event, of a person, of a team associated with a competition, etc.), propositions of Event-based Chronologies which the user (the AFP journalist

in that particular instance) may optionally modify before validation. This is hence an automatic processing step of the temporality of the texts, which should integrate not only the recognition, but also the analysis of a certain type of discursive organisation in the texts. The second axis concerns the visualisation of Event-based Chronologies, and the target this time is the end-user, i.e. the reader, the internaut or the owner of a multimedia telephone.

Even if our project is ambitious, it remains that the work methodology that we suggest makes it "reachable" in its objectives, in particular regarding the realisation of an effective processing chain. Indeed, we propose to anchor our working programme on the one hand in (i) the specification of a specific need and on the other hand in (ii) a close collaboration between the different partners for defining knowledge representation formats which are compatible with the knowledge extracted from texts as well as with the knowledge corpi to view.

Partners	CNRS - MoDyCo
	CNRS - LIMSI
	XEROX SAS
	Agence France-Presse
	Exalead SA
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ANR funding	504 260 €
Starting date and duration	February 2011 - 36 months
Reference	ANR-10-CORD-010
Cluster label	Cap Digital Paris-Région

Project title	**COGNILEGO :** Manuscripts indexation using cognitive integration : from pixels to semantics - Comparative studies and enhancement of the state of the art

Abstract

During the ANR blanche ANCL (2007-2009) with LSIS and LNIA, a project studying how the children learn to read, we demonstrated arguments in favor of a self-organized memorization of words (Dufau 2010). The model used in the study was a self-organizing map (Kohonen 1977) fed by inputs of letter bigrams (Grainger 2006). Given the strong performance of this model in orthographic reading, we want to use the same concept to explore word recognition. Our concept suggests that the cortex does not process information; it memorizes information. This memorization preserves the topology and the density of the probability of the data to which the cortex is exposed. In our model, each level of memorization constitutes a hierarchical and functional level. Like S. Dehaene (2007), we estimate that ten levels are required to go from a pixilated image to a sequence of words. The aim of the current project is to develop and test this word recognition model, called the Cogni-Lego. Our cognition-oriented proposals are original and state-of-the-art. After three years of research in the ANR blanche ANCL project, we propose to now integrate our findings with handwriting recognition models. The modular approach here proposed will allow us to complement the statistical approach of our industrial partner's handwriting recognition model. In the end, we aim to improve the overall performance of both our partner and our own models and to create a viable prototype of cognitive handwriting recognition.

Partners

Université Paul Cézanne : Aix-Marseille III - Lab. Sciences de l'Information et des Systèmes
A2iA SA
Université de Provence : Aix-Marseille I - Lab. Neurosciences Intégratives et Adaptatives

Coordinator

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ANR funding

224 885 €

Starting date and duration

November 2010 - 36 months

Reference

ANR-10-CORD-013

Cluster label	Cap Digital Paris-Région et OPTITEC (ex Photonique)

Project title	**COMPETENCES :** Global Reengineering Process for Acquiring and Developing Competencies

Abstract

For some years, a growing interest in skills approach has emerged. Indeed, the terms "skill" or "competence" was more and more used since the beginning of the 90's, that is at the time we can hear about the terms "knowledge society", "globalization" or "internationalization". The university world is troubled by the approach: students are impacted as well as teachers who are forced to call themselves into question about educational practice and course content. In August the 10th 2007, a French law about autonomy assigns to the University a new mission aiming to vocational guidance and professional integration. Thence, there is a strong relationship between skills approach in the education world and competencies search due to economic competition in the business world. Skills approach should give employees the adaptability to face with technological mutations and career change.   Our research aims to competencies acquisition in a blended learning situation when the learner can develop his competencies by operating within a complex environment. Our project is focused on a quality approach: a global reengineering process for acquiring and developing competencies. We need to track activities of all actors involved in the process when they interact together, and then calculate relevant indicators to improve the system efficiency: the learner can identify his strengths and weaknesses, and has the opportunity to evolve a plan of action (reengineering process of the plan of action by the learner); the teacher has significant elements to assist and guide learners during their activities (reengineering process of the plan of action by the teacher and reengineering process of activities support); the learning designer improves activities proposed to learners (reengineering process of activities' learning design) whereas the producer enhances his learning resources (reengineering process of learning resources production). To ensure a global process, a reconsideration of collected traces' and indicators' management is also necessary.

Partners

Université Paul Sabatier : Toulouse III - IRIT
CNRS - Cognition, Langues, Langages et Ergonomie
Université Paul Sabatier : Toulouse III - Bureau d'Aide à l'Insertion Professionnelle
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Coordinator

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ANR funding	710 970 €
Starting date and duration	October 2010 - 48 months
Reference	ANR-10-CORD-011
Cluster label	_

Project title	**CORVETTE :** COllaboRative Virtual Environment Technical Training and Experiment

Abstract

The CORVETTE project aims at introducing innovative scientific results in the field of industrial training based on virtual reality technologies (maintenance, complex procedures, security, diagnostic, technical gesture, …). The core scientific contribution of the project concerns the mutual synergies between 4 scientific challenges:
• Collaborative work dealing with complex scenarios relevant of training activities in industry, including joint physical technical gestures apprenticeship;
• Virtual human representing alternatively the avatar of the user or a virtual collaborator during a training session, for pedagogic purposes;
• Implicit or explicit communication between a real user (trainee) and a virtual human acting as collaborator;
• Advanced evaluation process with sophisticated cognition methodological approach, allowing a patterned qualification of all usability factors;
The CORVETTE project is also firmly oriented toward industrial applications. For this perspective, our approach is based on:
• An industrial software platform for integration. This platform is developed and marketed by Nexter Training (GVT®: Generic Virtual Training);
• Real and critical industrial use cases which are completely documented in our proposition, along with a needs assessment, allowing scientific achievements to be duly tested and valued
• External industry users (users group) interested in describing new scenarios and applicative constraints, in order to complement our analysis of industrial needs.

Partners

INSA de Rennes
École Nationale d'Ingénieurs de Brest - LISyC
Commissariat à l'Énergie Atomique
Golaem
Virtualys
Nexter Training

Coordinator

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ANR funding

993 780 €

Starting date and duration	October 2010 - 36 months
Reference	ANR-10-CORD-012
Cluster label	Images & Réseaux et SYSTEM@TIC Paris région

Project title	Datalift : Data lift from published raw data to interlinked semantic data

Abstract

DataLift's ambition is to act as a catalyst for the emergence of the Web of data. The web of data is a recently emerged way to publish data on the Web. It is made of large raw data sources interlinked together. It takes advantage of semantic Web technologies in order to ensure interoperability and intelligibility of the data. More specifically, it consists of:
* publishing data as RDF graphs: a very simple data format,
* linking these data sets together, by identifying equivalent resources in other data sources,
* describing the vocabulary used in published data through ontologies.
This Web of data has taken a strong acceleration recently with the publication by UK and US governments of public data (data.gov, data.gov.uk). Similar initiatives are flourishing across the world and, in France, data providers such as INSEE or IGN have already started experiments. Various citizen groups such as the Fondation internet nouvelle génération (FING) and RegardCitoyen.org are willing to take advantage of such data and the Agence du Patrimoine Immatériel de l'État (APIE) aims at providing a "portal" for such public data. However, if isolated data publication initiatives using semantic Web technologies exist, they remain limited for several reasons:
1. Similarly to the Web, the power of which comes from the interconnection of pages together through hyperlinks, the Web of data will only make sense if the data it contains are interconnected. A few interlinking tools already exist but require too much manual intervention for reaching Web scale.
2. A large number of ontologies covering various domains are quickly appearing, raising the following problems: many ontologies overlap and require to be aligned together for proper interoperability between the data they describe. Selecting the appropriate ontology for describing a dataset is a tedious task. Once an ontology selected, the data to be published eventually needs to be converted in order to be linked to the ontology. Solving these technical problems requires expertise, which leads to publication processes that are not suited to the publication of large amounts of heterogeneous data.
3. In order to ensure a publication space which is at the same time open and giving to each publisher its rights on the published data, it is necessary to provide methods for rights management and data access.
4. Finally, and again analogically with the Web, a critical amount of published data is needed in order to create a snowball effect similar

to the one that led the Web to take the importance it has nowadays. The goal of DataLift is to address these four challenges in an integrated way. More specifically, it will provide a complete path from raw data to fully interlinked, identified, qualified and "certified" linked data sets; it will develop a platform for supporting the processes of:
* selecting ontologies for publishing data;
* converting data to the appropriate format (RDF using the selected ontology);
* interlinking data with other data sources;
* publishing linked data.
In order to achieve this ambitious program, DataLift will unlock key obstacles in the development of the web of data by performing research on ontology selection and evaluation, on automatic link generation and evolution, on right expression and management.

Partners	INRIA Grenoble Rhône-Alpes - EPI Exmo EURECOM Mondeca SA INSEE IGN Atos Origin Integration INRIA Sophia Antipolis Méditerranée Fondation Internet Nouvelle Génération Université Montpellier 2 - LIRMM
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ANR funding	1 101 605 €
Starting date and duration	September 2010 - 36 months
Reference	ANR-10-CORD-009
Cluster label	Cap Digital Paris-Région

Project title	**DIGIDOC :** Document Image diGitisation with Interactive DescriptiOn Capability

Abstract

The DIGIDOC project belongs to the field of document digitization and more precisely the digitization of old and precious documents. In a global context where many big projects are devoted to the preservation of cultural heritage, the DIGIDOC project aims at improving a specific point, the image acquisition step. We focus on this first step in order to improve and simplify the future use of the digital documents (storage, text recognition, document retrieval, ...).

Our approach is to take into account a priori knowledge on the documents to be digitized and knowledge on how they will be used in the image acquisition step. In order to reach this objective, we propose to insert an additional module into scanners to provide a set of descriptors of intermediate level computed from the digitized image. These meta-data will be used thereafter to better acquire, store, analyze and index the digitized documents. In particular, they should allow to quantify the adequation between a given document digitization and its future use. The definition of such a set of features and its integration in a new format of digitized document is the main objective of the project. This new format will be the basis of new interaction procedures with scanners and of new documents analysis tools. A first application will aim at simplifying the choice of scanner parameters by semi-automatically adapt them according to the document characteristics and to the needs of the final users. A second application will be to quantify the quality of existing document images. These objectives are clearly in the topics of the call « Contenu et interaction » as they contribute to define a new file format dedicated to the description of the contents of digitized documents. This description can be used to ease and improve the storage, the processing, the comparison and the indexation of document images. This projet brings together research laboratories (LaBRI Bordeaux, LI Tours, L3I La Rochelle, LITIS Rouen), industry partners (I2S Bordeaux, Akhenum Bordeaux) and final users (BNF).

Partners

Université de Bordeaux 1 - LABRI
Université de Tours - Laboratoire d'informatique de Tours
Université de Rouen - LITIS
Université de La Rochelle – L3I
Bibliothèque Nationale de France
i2S
Arkhênum

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ANR funding	866 160 €
Starting date and duration	February 2011 - 42 months
Reference	ANR-10-CORD-020
Cluster label	_

Project title	**ESPRI :** Self exhibition, Privacy and Social Networks

Abstract

The problems associated with the collection of personal data and intrusion of privacy have taken a new dimension with the development of the internet and online social networks. The use of the internet as a platform for social interaction does indeed pose a new way to look into the privacy issues. The collection of personal data has become mostly decentralized making the internet a more or less open mine of data on individuals. The behaviors of internet users are also ambivalent, seeking protection while being quick in practice to give voluntarily or involuntarily sensitive data. These changes reflect the fact that the Web has evolved into a participative web. What happens to privacy issues and how to regulate them when the transfer of personal data is the product of social interaction on digital platforms whose economy is based on the exploitation of these data?

To be able to address this issue, we made two choices: interdisciplinary perspective and focus on behavior analysis. Privacy has raised economic, legal, sociological, technical issues and many others. These issues are closely related; hence it is difficult to tackle them by a strict disciplinary approach. We want to develop a structured interdisciplinary perspective that is limited to social sciences, namely economics, law and sociology. Our second choice is based on behavior analysis. The hypothesis of an ongoing transformation of privacy issues leads us to turn our attention to actual practices of suppliers and users of online interaction services. Considering privacy issues from the perspective of suppliers, we will analyze two data sources, i.e. the privacy policies established by the providers and a database of complaints collected by the CNIL during last 30 years.

The analysis of the privacy policies will be carried out by several methodologies: Analyse of econometric data, lab experiments, and qualitative interviews. Quantitative analysis of trials should allow us to test the hypothesis of the evolution of privacy issues since the 90s. The second aspect concerns the self-exposure on the internet. Understanding this behavior is essential to understand the current privacy issues. We will analyze the transformation of immodesty on online social networks. The weakening of the feeling of shame takes several forms, so using qualitative interviews will enable us to analyse the motivations for the various forms of immodesty on the internet. This study will be extended by an economic analysis of the dilemma between risks and benefits (created by online services) that includes self-exposure on digital

networks, using various methodologies (i.e. quantitative survey of two populations, lab experiments and qualitative interviews). A final study will analyze the behavior of individuals against the appropriation of location-based services that pose important problems associated with the traceability of individuals.

The last phase of the project is to build several scenarios tailored to the legal issues of privacy on digital networks seeking new points of equilibrium between the evolution of individual behavior, new business models and compliance with general principles. The expected outcome of the project is to help guide the necessary regulation of identified problems. Many options are indeed possible ranging from self-regulation to the need for new legal instruments.

Partners	Université Paris Sud 11 - Centre d'Analyse des Dynamiques Industrielles et Sociales Université Paris Sud 11 - Centre d'Etudes et de Recherche en Droit de l'Immatériel France Telecom
Coordinator	Alain Rallet – Université Paris Sud alain.rallet@u-psud.fr
ANR funding	376 184 €
Starting date and duration	October 2010 - 24 months
Reference	ANR-10-CORD-002
Cluster label	Cap Digital Paris-Région et SYSTEM@TIC Paris région

Project title	**ESTAMPILLE :** Secure printings using graphical codes

Abstract

The aim of the Estampille project is to fight against forged printed documents and counterfeited goods. In order to achieve this goal, the project proposes to insert Graphical Codes (GC) on the document or the package of the good. In a security framework, the use of GC enables (1) to perform integrity check of the printed document (we check that the content of the document has not been tampered and is not forged) and (2) to perform authentication (we prove that the document is not a counterfeit). Integrity check is possible by printing a robust hash inside the graphical code. Note that, contrary to classical hash, a robust hash is a secret digest of the content created using content analysis or random projections. The most important property of a robust hash is that it is not altered if the content does not suffer a semantic modification. With the use of GC, integrity check is possible since a counterfeit of the original print will undergo a "scan and print" process that will yield to an additional noise. This noise will be evaluated and detected thanks to the analysis of the GC.

The range of applications associated with the use of secure GC is very important: it can be used by custom services, by brand protection departments, on the assembly line, security authorities, … The goals and the bottlenecks of the Estampille project are:

- To analyse and model the printing process from a physical and signal processing perspective,
- To assess the global security of the authentication system,
- To design efficient GC for integrity check and authentication,
- To put in perspective the use of secure GC with the judiciary environment.

The working program will be build on a set of linked tasks: (1) the study of the process involved when a GC is printed, (2) the use of information theory for design code for authentication, (3) the building of robust hashes to enable integrity check, (4) the security assessment of the system and (5) the use of technical solutions to bring forensics that can be used by a law court. Moreover, the different scientific breakthroughs will be promoted by the building of a proof-of-concept platform.

The scientific, technical and economical advances linked to the Estampille project can be significant.

* From a scientific point of view: - The stochastic behaviour of the printing process has not been deeply analysed by the scientific community yet and the roles of different parameters such as the type of printer, the resolution, the ink and the paper have still to be found. - The digital scan of microscopic ink dots

of the GC after the printing process have to be characterized in order to quantify the distortion between the original document and a counterfeit. - We also plan to propose a novel approach mixing information theory and coding to guarantee authentication. The random codes that have been used up to now can be modified in order to optimize the classification step.
* From a technical point of view: - We will develop a new functionality (the integrity check) which is not yet implemented by the industrial Partner (ATT) - The technical solutions will be confronted with the juridical framework that will study the quality of the proofs in a lawsuit.   * From an economical point of view: - The increase of the security level of the actual solutions that use secure GC will enable to boost the competitiveness of the company ATT.

Partners	CNRS - Laboratoire d'Automatique, Génie Informatique et Signal CNRS – GIPSA-lab IMPG - Laboratoire Génie des Procédés Papetiers Université Paris Sud Orsay - CERDI Advanced Track & Trace SA Michel LATA
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ANR funding	813 927 €
Starting date and duration	December 2010 - 46 months
Reference	ANR-10-CORD-019
Cluster label	Industries du Commerce

Project title	**HYB-RADIO :** Augmented Radio Services through the Synchronized Aggregation of Multimedia Streams in Hybrid Broadcasting

Abstract

Broadcast Radio is still the most heavily consumed media in France. But we have seen its listenership erode over the years, mostly due to the appearance of new usage patterns, competing means of access and an overall diversification of content and consumption, in part through the durable installation of the internet in our lives.

Whether to uphold the principles of broadcast radio (its free nature, its pluralism, its proximity & spontaneity) or to preserve it economical model (publicity), over-the-air channels now find themselves having to evolve and join in modernizing their usage patterns and means of access.

The upcoming switch to Digital Radio through the T-DMB standard opens the door to new strategies of enrich Radio content, named "augmented radio" herein, aiming to merge visual or interactive content, synchronously or asynchronously to a high-fidelity audio feed.

This project aims to further the actual push around Digital Radio and augmented radio, by prolonging the work and investment already conducted by radio stations and content producers, notably through new service, user testing, new content and broadcast optimisation.

We will study in particular hybrid systems which associate a digital or analog over-the-air broadcast with enhanced contextual media sent over a connected environment such as 3G cellular networks or WiFi.

Our two main objectives are: - developing hardware and software solution for hybrid broadcasting and reception, allowing us to demonstrate prototypes for near-future product lines. - obtain a better understanding of emerging usage patterns in augmented radio thought creation of services.

In order to do this, we will meet challenges, including the absence of appropriate synchronization mechanisms for our hybrid model; and the absence of definitive studies of the uses of augmented radio, especially on the French market.

Our work will be split in 4 tasks (plus one coordination task):
1. Service Design, to analyze usage patterns and create new contents (visual, interactive, contextual, etc.) 2. Technological Development, of both broadcast and reception modules. 3. Integration and Demonstration of broadcast and reception prototypes 4. User Testing in the automotive, home and mobile contexts.

Our final expected products are technological modules for each of broadcast and reception. Our expected scientifical

output is a standard (ratified or not) for hybrid broadcasting of enhanced radio and a whitepaper report on usage patterns in such contexts. We expect this project to lead to the creation of a new line of products for enhance radio, both on the provider and listener sides of the spectrum. Those products, whether alternatives or complements to T-DMB should be pivotal in the rejuvenation of the broadcast ecosystem.

Partners	Vizion'R Institut Telecom - Télécom ParisTech Radio France Continental Caméon
Coordinator	Marc Brelot – Vizion'R marc.brelot@vizionr.fr
ANR funding	720 610 €
Starting date and duration	November 2010 - 24 months
Reference	ANR-10-CORD-008
Cluster label	Cap Digital Paris-Région

Project title	ICARO : Industrial Cooperative Assistant Robotics

Abstract

Today, inside the production plants the assembly stations are either manual or automated and protection grids systematically split the space between the robots and the humans. Recent evolutions of technology as well as of the safety standards allow a new production paradigm where humans carry out complex activities while robots execute the actions that are easy to automate, dangerous or non-ergonomical within a shared collaborative workspace, either in co-action or co-operation. The expected results are an improvement of the global performance of the socio-technical system through the added value of human work in terms of ergonomy, through a better use of specific capabilities of each and through a leaner automation.

The ICARO project aims the development of tools in order to improve and to simplify the interaction between industrial robots on one side and humans and the environment on the other side. The project also aims to produce tools build around a middleware software architecture securing the interoperability of these tools. ICARO differences from other projects aiming service robots by the implementation of industrial use cases, by the association of research laboratories and SMEs ready to commercialize the project's results, by the importance granted to the safety standards and by the participation of an ergonomy team in order to deal throughout the project with the human aspects.

ICARO will produce: - tools for intuitive robot programming including reactive planning of trajectories through fusion of real and virtual data as well as tools for robot programming through points learned by manual guidance and completed by process knowledge - Tools for perception of the environment linked to 3D models allowing faster, richer and more reliable interactions with the environment and the operators - An open source software architecture enabling the interoperability of the tools developed as well as its dissemination. The middleware will be selected on the basis of specific criteria for the industrial applications of the project. It will allow the interface and the transfer towards the industry of new human-robot interaction methods for complex manipulation applications. - A methodology of task attribution among humans and robots based on the physical and cognitive ergonomical analyses as well as production constraints.   Three complementary scenarios of non robotized applications have been identified and will allow the

validation of the developed tools:
- Scenario 1. Two arm robot cell with extrinsic safety
- Scenario 2. Co-operation and intrinsic safety cell
- Scenario 3. Co-action and nomad robotics
The project includes an industrial validation of the entire set of developed modules through the integration on selected use cases representing today issues in two strategical sectors for France : automotive and aeronautics.
This final phase sustains the dissemination activities and the transfer of results. The objectif/goal is that the set of developed modules validated within the project be transferred towards the industry for future exploitation and commercialization. These activities will also be oriented towards other industrial sectors, SMEs and towards robot constructors, their integrators and the providers of software solutions for robotics.

Partners	EADS France CNAM FATRONIK France Kineo Computer Aided Motion CNRS - LAAS CNRS - LIRMM Peugeot Citroën Automobiles SA
Coordinator	Adolfo Suarez Roos – EADS France adolfo.suarez@eads.net
ANR funding	744 584 €
Starting date and duration	March 2011 - 36 months
Reference	ANR-10-CORD-026
Cluster label	Cap Digital Paris-Région, VIAMECA et Aerospace Valley

Project title	**IMAGIT :** Multi-actors and Multi-interactive tables with tangible and virtual objects environment

Abstract

The project consists to design, realize and test an new environment making it possible a whole of users to interact in a way distributed using a set of interactive tables, but also tangible and virtual objects; the situations must also allow the connection of different other devices with the table(s), insofar as certain users can be equipped with PDA or laptops. The situations to study and to implement concern tangible objects embarking information (with or without writing during the contexts of use) and/or objects for which information is contained in agents of a multi-agent platform. This platform would thus implement interactions between human actors as well as virtual ones. This project is based on the results obtained within the ANR TTT project (Techno Log 2007). During this project, an interactive table called TangiSense was developed; demonstrators based on the table had a strong impact in several forums. This interactive table is based on RFID technology for the identification and the localization of tangible objects. Software layers were developed during this project, making it possible people to interact around the table. During TTT project, the table was not planned at all for contexts of distributed interaction. The IMAGIT project would thus make it possible (1) to solidify the already developed software layers and (2) to extend the device to handling mixed (i.e. virtual and tangible) objects on several distant devices thus allowing a greater mobility and a distributivity of the tasks between the groups of distant users. There does not exist at the present time environments allowing such distributed interactions, implementing as well tangible objects as virtual ones, for example for design, configuration, problem solving or crisis management contexts, in which a whole of actors of various competences and having several objectives interact, while being distributed geographically and using varied devices. This project thus aims at proposing signification advances in this field.

Partners

Université de Valenciennes et du Hainaut-Cambrésis - Laboratoire d'Automatique, de Mécanique et d'Informatique, industrielles et Humaines (LAMIH)
Université Joseph-Fourier – Laboratoire d'Informatique de Grenoble (LIG)
RFIdées
SUPERTEC

Coordinator

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ANR funding	587 000 €
Starting date and duration	October 2010 - 24 months
Reference	ANR-10-CORD-017
Cluster label	_

Project title	**iSpace&Time :** 4D City-GIS on the web A convergence between mapping, sensor web, immersive reality, animation and simulation technologies

Abstract

This project aims at developping a technology preview portal. This portal will provide access through the internet to a 4D Geographic Information System of the city. Several new technologies will be integrated in one such as web2.0, Sensor networks, immersive visualisation, animation and simulation. It will allow to answer to a wide range of needs including 4D city visualisation, urban planning decision support tools, collaborative updating of topographic databases (crowdsourcing) and collaborative capture of disabled-oriented databases.   The main scientific contributions of the project are:

* to develop an immersive and continuous visualisation, starting from a topological graph of panoramics captured by a terrestrial digitisation vehicle combining both laser and images using image based rendering techniques to interpolate between views by deformation and continuous multiplexling of close panoramics with depth maps.

* to integrate heterogeneous data coming from sensor networks to measure mobility fluxes (with GPS trakcs, mobile phones, etc.) for pedestrians, cars and other mobile objects.

* to use video cameras to measure these fluxes in real-time flux without needing any recording.

* to populate the environment with dynamic objects (pedestrians, cars, boats, etc.). These objects will be integrated in the immersive visualisation with realistic behaviours taking into account real mobility data (sensor networks, cameras, etc.) as well as constrained trajectories on a precise map of the environment describing its properties and the associated transportation possibilities (road surface, sidewalk, bus lane, etc.)

* to simulate the impact of a planning decision on trafic

* to use crowdsourcing as a mean to involve citizens in the creation and updating of collaborative databases

* to augment 3D navigation with external content and knowledge extracted from a great quantity of heterogeneous information (Wikipedia, Panoramio, Flick'r, etc.) using automatic and manuel structuration techniques

* to integrate the time dimension in the information system, for the visualisation as well as for the extraction of information and for the simulation (temporal flux archives)

* to work on a huge data sets, the whole of Paris (10 millions of 20MPix panoramics and 100 billions laser points), in order to prove the scalability of at least a part of these technologies.

Scientific, technical and economical consequences of this project can be important. Aside from linking scientists usually working seperately, the project could give way to a technologcial leap allowing to answer in an unified manner to a great number of user needs, from the general public to local authorities, planners and decision makers, etc. Several applications of the portal will be inverstigated as scenarios answering a specific need expressed by users:

* cultural and tourisitic search engine (IGN research)
* impact assessment of a development in terms of trafic flux and decision support (associated partner: Paris city council)
* collaborative corrections and updates of cartographic and topographic databases (associated partner: IGN production)
* cartography of the accessibility for disabled persons (associated partner:association "Mobile en ville")
* fluvial navigation simulator (associated partner: CETMEF)

Partners	Institut Géographique National Telecom ParisTech Université Blaise Pascal Clermont-Ferrand 2 – LASMEA France Telecom / Orange Labs INRETS - LICIT Université de Rennes 1 – IRISA
Coordinator	Nicolas Paparoditis – IGN nicolas.paparoditis@ign.fr
ANR funding	1 068 980 €
Starting date and duration	March 2011 - 36 months
Reference	ANR-10-CORD-023
Cluster label	Cap Digital Paris-Région et Images & Réseaux

Project title	**KOLFLOW :** Man-machine collaboration in continuous knowledge contruction-flows

Abstract

Web 2.0 is currently producing a huge amount of information. Continuously transforming this information into knowledge is a major challenge for the research community. Automated reasoning or collective intelligence are currently two representative approaches to transform content into knowledge. The Kolflow project proposes to extend collective intelligence with smart agents relying on automated reasoning. Smart agents can significantly reduce the overhead of communities in the process of continuously building knowledge. Consequently, continuous knowledge building is much more efficient. Kolflow aims at building a social semantic space where humans collaborate with smart agents in order to produce knowledge understandable by humans and machines. Humans are able to understand the actions of smart agents. Smart agents are able to understand actions of humans. Kolflow targets the co-evolution of content and knowledge as the result of interactions of humans and machines. If human-machine collaboration can be the key to ensure co-evolution of content and knowl- edge, such collaboration can fail if not managed.

The Kolflow project addresses the following scientific issues:

* Man-machine collaboration: Man-machine collaboration can be very unstable and make the whole system divergent. How to coordinate the actions of distributed agents, either software or humans, sharing web contents and knowledge accessed by web users at a potentially large scale? In particular, a key issue is to guarantee a minimal stability and the non-regression of the whole system.

* Man-machine collaboration for humans: how to make formal knowledge and its evolution accessible, usable, editable and understandable by human agents so they can observe, control, evaluate and reuse the outputs of smart agents?

* Man-machine collaboration for machines: how to support and take into account the unpre- dictable behavior of human agents that can at any moment add or modify content and formal knowledge with the risk of introducing uncertainty or inconsistency? How auto- mated reasonings can adapt their behavior and results by taking into account feedback from human agents? How these tools can adapt their behavior and results to specific user needs in a given context? The Kolflow project aims at tackling man-machine collaboration issues with the following approach:

1. Deliver man-machine collaboration scenarii and some reference corpus. These scenarii drive the project and evaluate the overall progression of others Kolflow tasks.

2. Build a social semantic space based on distributed semantic wikis. This social semantic space behaves as a blackboard for man-machine collaboration. Coordination of agents is based on process representation and enactment. The whole system is accessible by humans and machines through distributed semantic queries.

3. Make histories of knowledge building understandable by man and machine. This is the key to make smart agent aware of humans reactions to their actions.

4. Make automated reasoning understandable by humans. Smart agents must explain what they did and why they did these actions to humans.

5. Manage inconsistencies generated by man-machine collaboration by allowing interactive reasoning with a globally inconsistent family of ontologies.

Expected scientific results of the Kolflow project will be a number of publications in the area of semantic web, computer-supported cooperative work, and knowledge discovery and data mining. The technical result of the project will be fundamental and practical knowledge in man-machine collaboration. It includes a basic corpus and scenarii and prototypes that enacts man-machine collaboration scenarii. If successful, Kolflow will demonstrate how it is possible to extend collective intelligence with smart agents in order to ensure co-evolution of contents and knowledge.

Partners	Université de Nantes - LINA INRIA Sophia Antipolis Université Henri Poincaré Nancy 1 - LORIA Université Claude Bernard Lyon 1 - LIRIS, équipe Silex
Coordinator	Pascal Molli – LINA pascal.molli@univ-nantes.fr
ANR funding	723 706 €
Starting date and duration	February 2011 - 42 months
Reference	ANR-10-CORD-021
Cluster label	_

Project title	**MetaSon :** Sound metaphors

Abstract

How can we help improving the driver's control of silent vehicles? How can we alert pedestrians to potential dangers caused by silent vehicles? My pen knows the graphical quality of my gesture; how can it give me the related feedback? These questions, which at first glance might seem dissociated, arise from a general problem that aims at defining the best strategy to inform people on the temporal evolutions of a dynamic system (here the vehicle or the writing gesture) within a specific cognitive context (in the situation of pedestrians, conductors or writers). The sound represents an incontestable sensory modality to address such questions. In fact, sounds are intrinsically linked to time and therefore perfectly adapted to the expression of dynamic characteristics. Moreover, sounds bring additional information about things that are outside our field of view in a natural way, hence revealing the invisible.

The "MetaSound" project proposes a genuine investigation of fundamental questions for an optimal use of sounds in the context of augmented reality by the means of two problems that are both rich and challenging because of the imposed constraints and the industrial and societal consequences that they induce: - Which sounds for tomorrow's cars? The purpose of this task is to prepare for the acoustic rupture linked to novel traction chains (hybrid/electrical) and to propose sounds adapted to the expectancies, the security and environmental constraints to improve the control of the vehicle (interior car sounds) and to protect the vulnerable persons (exterior sounds). - Which sounds for a sensory feedback linked to writing gestures? Dysgraphic disorders are most often linked to a lack of coherency between the writing gesture and the graphical task. The sound, because of its dynamic inherency and its lucidity, is an appealing modality to sonify the gesture and hereby help children overcome their handicap by improving their dynamic trajectories when writing.

The scientific milestones of the MetaSound project are based on three fundamental questions: - What should be sonified? (the input variables of the system and their associated rules) - Why sonify? (the cognitive context and the sensory expectancies) - How to sonify? (the genesis of sound metaphors). To exhaustively treat these questions, a strong multi-disciplinary interaction is needed.

The consortium gathered around the MetaSound project unites the necessary competences, hereby enabling a formal and original approach to the problem by taking into account human factors and by using a genuine language of sounds

constructed thanks to the ductility of digital synthesis and the semiotics of sounds. The project is divided in six strongly interacting tasks, which susceptibly will lead to theoretical, technical and applied advancements. In addition to the coordination task, two main tasks concern the applications of the project and will be validated by the realization of a sonified, rolling prototype (car application) and a prototype to assist dysgraphic persons. Two more fundamental tasks will establish original models and methods to characterize the dynamic contents of the sound signals and their reproduction by synthesis. They will allow the construction of sound metaphors and the conception of high-level control processes that act on attributes linked to sensations. The last task is strongly technological, since it concerns the realization of a real-time synthesis platform of spatialized sounds controlled by external variables and specific cognitive scenarios to the intended applications. It will constitute a very general tool disposed for dissemination in any community linked to augmented reality and applications to interactive sounds (cinema, video games, …).

Partners	CNRS – Laboratoire de Mécanique et d'Acoustique CNRS – Laboratoire d'Analyse, Topologie et Probabilités CNRS – Institut de Neurosciences Cognitives de la Méditerranée Peugeot Citroën Automobiles SA
Coordinator	Richard Kronland-Martinet – LMA kronland@lma.cnrs-mrs.fr
ANR funding	959 980 €
Starting date and duration	November 2010 - 48 months
Reference	ANR-10-CORD-003
Cluster label	_

Project title	**MOANO :** Models & Tools for Pervasive Applications focusing on Territory Discovery

Abstract

Mobile peripherals are invading everyday more our lifes. Pervasive applications that can be downloaded into those peripherals (with App Store or Google Store) allow assisting everyday tasks of mobile users. Mobile users naturally query map services before moving. They used to download applications and to configure them. They also download data that they predict to use as they are on a given geographic territory. Those with computer science skills know how to use Android Frameworks and/or Google Maps in order to make available before moving (and eventually to publish on website like Android Market), the applications according to their needs. In this project, we are interested in useful applications to complete/increase the discovery of a territory. Such applications generally include a mapping component (visualization and spatial annotations, base maps are often locally stored as rectangular zones), a textual component (visualization and annotations of documents linked to the spatial position of the user), components allowing to acquire useful resources (GPS data, pictures, videos, short texts, etc.), communication components in order to exchange with database servers (emission/reception of pictures or more generally of multimedia documents) and other more specific components needed by the user to realize his job.

While moving in a territory, mobile users often encounter problems with their handheld computers/mobiles. Some locally stored data become useless or unnecessary whereas other data is not included in the handheld computer. Some software components, part of the whole applications can become useless to process some information or documents that the user did no predict to manage during his mission.

In order to answer such difficulties, our project has three operational objectives: a. To enlarge the communication scale. Communications are not only between the mobile user and a central server, but can be established with other mobile users in his close environment (hiker, scientific responsible, etc.) that can be joined with wireless solutions. Such environment can help to find/provide missing data/software or can host part of the needed process. b. To provide people without computer-science skills with a toolset enabling them produce / configure mapping applications that will be hosted on their mobile phone. The aim is to enable a user to assemble/reorganize a mapping application from components and documents that he has and/or he could reach/get in his close environment. If such assembling/aggregation can seem difficult to reach on

Smartphones but we believe that users of Notebooks have enough physical power (Screen, CPU, Ram, Bandwidth and Battery) to reach this objective. c. To process all the documents of interest in order to make their spatial and thematic semantics available to mobile users. Thus, while moving on a territory, they will be able to query such documents (locally or in their environment) according to spatial and thematic criterions. These operational objectives raise many technical difficulties as well as scientific locks structuring our project.

Partners	Université de Pau et Pays de l'Adour - Laboratoire d'Informatique CNRS – Laboratoire d'Informatique de Grenoble (LIG) Université Paul Sabatier Toulouse 3 – Institut de Recherche en Informatique de Toulouse (IRIT) Université Lille 1 – Laboratoire d'Informatique Fondamentale de Lille (LIFL) Bibliothèque nationale de France
Coordinator	Philippe Roose – LIUPPA Philippe.Roose@iutbayonne.univ-pau.fr
ANR funding	583 220 €
Starting date and duration	December 2010 - 45 months
Reference	ANR-10-CORD-024
Cluster label	_

Project title	**NIKITA :** Natural Interactions, Knowledge, Immersive system for Training in Aeronautic

Abstract

A real need of technological tools for training in professional aspects appears. It is the case in particular in the field of the aeronautics where the simulations without risks for the product and the learner, and the adaptability and the personalisation of tools would be main advantages. The virtual reality, the artificial intelligence and the serious game allow today to propose successful tools to adress this need. But two criteria ask for a reflection and for a more pushed validation: the certification of the trainings and their cost. We are going to be interested for it in three essential questions: 1) which interactions to propose? 2) which educational contents, which knowledge to represent and which reasonings to propose on these knowledge? 3) which coupling between didactic, educational and playful approaches of serious games? Our solutions will be based on approaches in cognitive ergonomics, in knowledge engineering, in artificial and really virtual intelligence. From the three previous questions, we have identified a major scientific lock: which contents and which interactions to improve the learning? From this scientific lock, two technical locks appear 1) the absence of models and formalisms to build and adapt dynamically the environments, the activity support in a coherent way with the aimed objectives. Or still how to conceive and to dynamically scripting at once credible virtual environments compared to the expected behavior, endowed with didactic and integral contents of the rewarding aspects to facilitate the commitment of the learner in its learnings? And 2) how make credible the gesture? Concerning the first lock, the approach proposed by Heudiasyc UMR6599 and the LATI will be based on techniques of representation of the knowledge to allow the experts to supply models and in the decision-making modules to argue and to draw all the links of causes with effects. The originality of our approach to conceive these virtual environments for the human learning is to propose an architecture based on knowledge which allows to organize, to manage and to represent the knowledge necessary for the learning. This approach is current in the EIAH, but it is not still in the virtual reality domain. And this domain asks new questions on the more free interactions, in particular in the case of natural interactions. Concerning the second lock, The CEA LIST has already developed an original solution which allows users to pilot their physicalised virtual in a physical simulation by using a system of motion capture. Within the framework of this project we wish to spread the proposed solution of the case of flight cameras. The originality of our approach to determine the posture of the operator is to combine

a sensor which supplies directly real time a cloud of calibrated points and a physical model of the person to capture real time. Moreover the physical model which represents the learner is remote-controlled in order to take into account the biomechanical aspects and the motor control. This approach should bring a big robustness to the eclipses or in the conditions of lighting.

The industrial and economic effects can be envisaged under two aspects: - The offer NIKITA will meet an important industrial market because the training in the maintenance upstream to the construction of devices in the aeronautical domain is one of big problems of the industry. It concerns very directly AIRBUS training, Eurocopter and of numerous sites of training - the possibility of certification in virtual environment will be a quality factor of the educational contents and the interaction modes.

Partners	CNRS - HeuDiaSyC - UTC CEA LIST EADS France Université René Descartes (Paris V) - LATI EMISSIVE
Coordinator	Domitile Lourdeaux – UTC domitile.lourdeaux@utc.fr
ANR funding	859 860 €
Starting date and duration	December 2010 - 43 months
Reference	ANR-10-CORD-014
Cluster label	_

Project title	**ORIGAMI 2 :** Non Intrusive Marketing Behaviour Analysis through Gaze and Gesture Observation

Abstract

ORIGAMI 2 is a research project with industrial applications positioned on the theme "CONTINT" from the 2010 ANR's invitation to tender. This project is following up the ORIGAMI project presented in 2009. It has been redefined and reviewed thanks to ANR and Cap Digital Experts' comments. The aim of the project is to develop real-time and non intrusive tools designed to analyze the shoppers buying act decisions. The approach is in the first time based on extracting and following the shoppers' gaze and gesture positions with computer vision algorithmic. It is then based on statistically analyzing the extracted data: the goal of this cognitive analysis is to measure the interaction between the shopper and its environment. This technology will provide consumer goods producers with non biased and exhaustive information on shoppers' behaviors during their buying acts within the shelves.

Partners

SAS CLIRIS
Institut Telecom - Télécom ParisTech
BONGRAIN SA
Université d'Evry-Val d'Essonne - Laboratoire Informatique, Biologie Intégrative et Systèmes Complexes
CNRS - Laboratoire des sciences de l'Information et des Sytèmes
Université Paris 8 Vincennes-Saint Denis - LUTIN / CNRS

Coordinator

Alexandre Revue – CLIRIS
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ANR funding

738 500 €

Starting date and duration

Février 2011 - 36 months

Reference

ANR-10-CORD-016

Cluster label

Cap Digital Paris-Région

Project title	OTMedia : TransMedia Observatory

Abstract

The world of media is strongly impacted by the digital revolution: means of production, publishing, and broadcasting broaden and users' practices evolve, changing on the way established economic rules. The CrossMedia Observatory aims at building processes, tools and methods to analyze and better understand the challenges and the evolution of the media sphere.

Our objective is to create an integrated system allowing the analysis of a large range of information sources, web sites (blogs, Press, TV and Radio websites), newspapers, Radio and TV media streams in a large period of time (12 to 18 months). More precisely, we want to detect, identify, monitor, measure, analyze, and study the spread of media events and their derivatives. The CrossMedia Observatory project is driven by the needs of social sciences research and of information protagonists. This strong collaboration between scientific research and social science aims at developing new concepts and analytical tools able to characterize the evolution of the media sphere. The project gathers partners from several research domains: linguistic and text analysis, transcription, computer vision, search engines, and visualisation. Each scientific partner brings not only their expertise in their field, but also makes available to the project high performance software. Therefore the project may focus on the main technological bottlenecks and challenges: formalisation of the crossmedia objects with relations and event concepts; transcription enrichment from cross media resources; discovery and tracking of events and dynamic visualisation. Additionally those are processed on very large scale data.

The strengths of this project lie in the synergy between IT and social science research, the development of high performances tools, together with resource diversity and volume. The ambition of the TransMedia Observatory is to make the relationship between the Internet, press, radio and television broadcasts more intelligible, viewable and searchable at a macro-level of analysis. The automatic tracking and monitoring of media entities and events at a variable temporal granularity will facilitate this.

If the proliferation of media sources that broaden users' practices is a reality, does it ensure nevertheless the information plurality? Who produced the information? Who is the source? These questions are a matter of general interest for the society of today and tomorow.

Partners	Institut National de l'Audiovisuel Agence France-Presse Université d'Avignon et des Pays du Vaucluse - LIA INRIA Syllabs Université Paris 3 Sorbonne Nouvelle - Communication, Information, Médias
Coordinator	Marie-Luce Viaud – INA mlviaud@ina.fr
ANR funding	994 480 €
Starting date and duration	Novembre 2010 - 36 months
Reference	ANR-10-CORD-015
Cluster label	Cap Digital Paris-Région

Project title	**PERIPLUS :** Multi-terminal navigation platform for multimedia news content

Abstract

The area of accessible content from public networks (eg Internet) or private is in a phase of profound transformation, due to the digitization of most publications, the diversification of media and terminals. The proliferation of information and digital knowledge accessible through search engines, video on demand, exchange platforms and annotations or social networking face today major challenges economically and socially. Among these major challenges, let us focus on how to interface with the mass of digital documents. The amount of data, the increase in photographs / videos and the emergence of new terminals (including mobile) has necessitated the development of new access systems to large databases of documents of virtual worlds, particularly in terms of navigation and information synthesis. This is especially a problem for the flow of information that feeds daily newspaper websites, television, radio, or blogs.

In this context, Periplus is an industrial research project which meets in the specific environment of participatory journalism on the Internet, the challenge of navigating the multimedia corpus that is accessible in digital databases from terminals. This project proposes to develop a synergy between research in ICST (CEA LIST, Alcatel-Lucent Bell Labs), design (Pompidou Center-IRI), usage (CNRS Lutin) and industrial (Diotasoft, Alcatel-Lucent) to propose several demonstrators with innovative methods of research, mapping, navigation and interaction supported by new technologies for processing multimedia data. We will mainly show the relevance and feasibility of using individual or collective dynamic tools of classification, generation of multimedia summaries, gestural interaction and navigation within a corpus of news, developed both in functional and economic angles.

The navigation platform will be tested by analysis of usage in the particular context of a digital newspaper of general information (Mediapart).

The expected progresses of the project are based on:

- An analysis of research practice of multimedia material from various terminals, focusing on new trends induced by analytical tools and treatment implemented in the project.

- The creation by designers of innovative navigation interfaces including the presentation of different information and functionality provided by technology and new modes of interaction (particularly tactile).

- The automatic creation of dynamic classes and summaries in navigable terminals and requests oriented and enhancing

the text, image or video from multimedia documents.
- The modification of software tools and formats required for submission interfaces developed on several terminals (mobile, computer).

Partners	CEA - LIST Institut de Recherche et d'innovation (IRI) Mediapart Alcatel-Lucent Bell Labs France Diotasoft SAS Université Paris 8 Vincennes-Saint Denis – CNRS/LUTIN
Coordinator	Bertrand Delezoide – CEA bertrand.delezoide@cea.fr
ANR funding	1 151 403 €
Starting date and duration	March 2011 - 36 months
Reference	ANR-10-CORD-026
Cluster label	Cap Digital Paris-Région

Project title	REVES : Plant Recognition for Smartphone Software

Abstract

These days, everyone almost has a mobile phone. These phones are used not only for phone calls but incorporate many features useful in everyday life or simply for fun (e.g. GPS, photo or video camera, accelerometer, Internet connection, etc.). Given the characteristics of these new devices (the relatively small computing power of embedded, the limited memory, the poor quality of images, the network connection that can be lost, limited battery) and according to the various possible uses, new scientific challenges exist in computer science but also in humanities.

In order to highlight these challenges, we will study in this project the following scenario: a person during a walk in the forest or in a natural park takes a picture of a plant (flower or/and leaf) with her/his cell phone in order to have information about it. She/he can possibly interact with the application by specifying the part of the plant, which is taken into consideration (flower or leaf) and/or by pointing the object on the touch screen. If the picture has not a good enough quality, the system could propose to the user to take another picture. Then, after a content-based retrieval process, the system suggests one or more responses with their confidence levels. The system may also return one or several photos of the suggested plants, in order to let the user check the validity of the answer by looking at the real plant. The user selects an answer and obtains the description of the plant. He can also ask to see any other available description. It should be noted that in order to give the best answer to the query, the system will be based of course on the analysis of photographs taken by the user, but also on various data available on Smartphones such as the geographic coordinates obtained via a GPS, the date, wheater?, etc. and some other usual features of flowers or of leaves at a given altitude, in a given region or at a given time of the year.

First, we propose to study different methods to characterize the object of interest in the image. Methods of literature should be adapted to take into account on one hand, natural objects a priori rather difficult to treat and secondly, the constraints linked to Smartphone. The various steps are then to estimate the quality of the image, to segment the object of interest and finally to extract geometric and statistics features to describe it. In this task, botanists will help computer scientists to find discriminating features. Secondly, as we propose to retrieve the data recorded in the botanical database, by taking into account the user position (spatial data) but also some other contextual data accessible via the Smartphone such as the season or the

weather for example. An important work will be performed on the fusion of heterogeneous data. In this context, geographers will participate to the elaboration of the signature. Third, geographers will study the uses of such a device. We plan to question scientists, park managers, biology educators and walkers about their point of view about a Plant Recognition Smartphone service. We will try to understand the change that can be expected in the practice and the understanding.

A company that is specialized in mobile development is part of the project. It can guide researchers, whose goal is to develop prototype software, to workable solutions on mobile. The company through a consortium agreement could then exploit the fruit of this research. The scientific results of this work will be published in international journals and conferences and will be usable in other contexts incorporating similar constraints. The work will also be popularized to the general public through a website and many applications of such a project could emerge such as citizen science, nature conservation, environmental serious game to learn to recognize species or contribution to Web 2.0.

Partners	Université Lumière Lyon II - LIISI Université de Savoie Annecy - LISTIC Université Jean Monnet Saint Etienne « Environnement, Ville, Société »
Coordinator	Laure Tougne – LIRIS laure.tougne@liris.cnrs.fr
ANR funding	517 025 €
Starting date and duration	October 2010 - 36 months
Reference	ANR-10-CORD-005
Cluster label	_

Project title	RTIGE : Real-Time & Interactive Galaxy for Edutainment

Abstract

RTI Galaxy for Edutainment program proposes to address the problem of display, representation and real-time rendering of scenes composed of massively heterogeneous possibly animated elements. This theme will be applied to the particular field of the Galaxy. This complex astronomical object is composed of thousands of billions of stars of type and of different ages and clouds of gas and dust of different natures, distributed according to a non-homogeneous distribution. These individual components are sometimes isolated and sometimes brought together to form sub-systems (multiple stars systems, nebulae...), in addition this structure is permanently in motion with a global dynamics, but also with sub-local dynamical systems.

We will work on themes such as: real-time display of massive animated scenes, amplification of animated volumetrics and points datas, procedural generation process, realization of models constraint by laws of distribution probability, integration within a scene of known data and potentially competitive generated data, realistic rendering of databases containing clouds of gas and dust of various kinds and a massive number of light sources of different characteristics. These themes will be addressed in terms of interactive time with a technology development program using the CPU and GPU programming and lead to development of technologies that can be used in other application areas such as simulators, video games, special effects industry, astronomy popularization...

In addition to the ambition of technologicals developments, goals of this project are: a significant quality improvement of simulations proposed in astronomy outreach - building of a working structure between industrial, researchers in astrophysical and researchers in digital imaging - improvement of validation, communication and educational tools of researchers in astrophysics - significant technological advance in astronomical objects visualization.

Partners

RSA Cosmos
INRIA Grenoble Rhône-Alpes - ARTIS et EVASION
CNRS - Observatoire de Paris – équipes GEPI et LERMA

Coordinator

Benjamin Cabut – RSA Cosmos
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ANR funding 957 185 €

Starting date and duration	December 2010 - 48 months
Reference	ANR-10-CORD-006
Cluster label	_

Project title	**Sample Orchestrator 2 :** Hybrid Sound Processing and Interactive Arrangement for New Generation Samplers

Abstract

Sampling is the main sound synthesis technique used in music and sound production (electronic instruments, sound post-production) due to its advantages (low RAM and hard disk memory cost, low computation cost, sound quality and exhaustiveness of the different types of produced sounds). However, it presents important limitations (low control flexibility, weak management of transitions between notes). Approaches developed in recent products consist in recording all possible combinations of playing modes, but their production is costly and they still result in limited extent and flexibility. This is also true for sound spatialization methods, which rely on the convolution of the signals with impulse responses of measured rooms, with the need of having measurements for all combinations of sources and listener positions. Conversely, existing parametric models, both for sound synthesis and spatialization, satisfy requirements of flexibility but are limited in their possibilities of simulation and require in certain cases more processing power. Moreover, using pre-recorded sounds in contexts of instrumental performance requires a deep musical expertise and does not benefit of assistance tools.

The Sample Orchestrator 2 project aims at overcoming these various limits, through the following R&D objectives:

1) enhancing the quality-flexibility/cost ratio of sound synthesis methods through the development of new hybrid techniques, based on the modeling of instrument sounds and providing expressive transformations which respect their characteristics;

2) enhancing the quality-flexibility/cost ratio of sound spatialization methods through the development of hybrid methods between convolution and parametric models;

3) development of new interactive music synthesis methods providing different forms of on-the-fly augmentation of the musician performance (voicing, arrangement, orchestration) while respecting musical rules inherent to defined musical styles.

Reaching these objectives implies the realization of an interdisciplinary research program in the fields of acoustics and digital audio signal processing (instrument sounds modeling, sound spatialisation, real-time processing architectures) and computer music (modeling and learning of musical rules, interactive generation).

The targeted application fields concern the music industry,

sound and music production, as well as multimedia applications of sound spatialization (simulation, virtual reality). The integration of the research results is foreseen through the development of a new generation hybrid synthesizer product, aimed at outperforming the characteristics of existing products. Moreover, all research results will be integrated in advanced software environments for music and sound creation and performing arts, and in specific products for musicians and professionals of audio production. They will be experimented and disseminated in the framework of higher education in music and sound. All targeted scientific and technical objectives go beyond the international state-of-the-art in concerned scientific disciplines and markets. The three project partners are leaders in their respective activity fields (sound and music technology research, sampler and sample banks products, higher education in music and sound) and the project may significantly help them develop their competitive advantage.

Partners	IRCAM Conservatoire national supérieur de musique et de danse de Paris Univers sons
Coordinator	Hugues Vinet – IRCAM hugues.vinet@ircam.fr
ANR funding	770 000 €
Starting date and duration	November 2010 - 30 months
Reference	ANR-10-CORD-018
Cluster label	Cap Digital Paris-Région

Project title	**SUMACC :** Pattern for Cooperative Indexation of Multimedia Flow

Abstract

Looking for named entities on the Internet is becoming more difficult, especially since the rapid increase of multimedia data online. Even if the actual methods for named entities detection in textual data are quite mature, the detection on diverse multimedia objects seems to be much more difficult to model. Because of this difficulty, the data needed to find robust identifiers is much higher. The high cost of multimedia data annotation limits indeed the usage of statistical methods which have proved to be effective. On the other hand, the concepts (or entities) that could be looked for appear in different ways depending on the support (audio, text or video support). Thus, the conception of generic methods constitutes a major scientific challenge in the field of multimedia detection. The SuMACC project suggests exploring original learning methods to detect multimedia entities by using specific detection patterns. The usage of those patterns offers a unified framework to express different rules of combination. In this context, we will suggest low supervised methods to estimate the entity's signature for each media. Furthermore, we will develop active learning and cross-media co-learning methods aiming to diminish considerably the effort of supervised learning. All these methods will be evaluated in the frame of the Wikio web-portal that offers the possibility of initial structuring of data and running an evaluation under real conditions. The SuMACC project will cover these topics in the frame of a Fondamental Research Project with a duration of 36 months led by Laboratoire Informatique d'Avignon (LIA - Université d'Avignon), Eurecom Laboratoire and the companies Syllabs and Wikio.

Partners

Université d'Avignon et des Pays de Vaucluse
Institut EURECOM
Wikio

Coordinator

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ANR funding

840 110 €

Starting date and duration

January 2011 - 42 months

Reference

ANR-10-CORD-007

Cluster label

SCS et Cap Digital Paris-Région