Foreword

The Centre Universitaire d'Informatique, located in the Uni-Dufour building at the University of Geneva, is one of the oldest computer research centres in the world. Professor Bernard Levrat created the Centre in 1973, where the Mathematics and Physics departments were the only ones to use computers. Since the Centre's creation, and through the effort of its members, it has developed very early innovative applications such as a word processing application, a portable operating system for mini-computers, a touch-screen, to mention a few; overall the Centre has had many significant students, such as Daniel Borel who created the company LOGITECH.

Since then, the centre has continued to develop an interdisciplinary program working in all kinds of fields and applications, such as Virtual Humans, Augmented and Virtual Reality, Cellular Automata Approach, Complex Simulation of Flows and Information Systems theory. There are several new projects in Bioinformatics and Functional Proteomics, along with the Swiss Institute of Bioinformatics, which have been developed, as well as Watermarking Techniques, Stochastic Image Processing and Multimodal Interactions.

As you will discover in reading this activity report, the range and depth of our interests are extensive and respond to rapid changes in computing and information technologies. It is my pleasure to encourage you to read this activity report and to appreciate the excitement and academic excellence enjoyed in our Research and Teaching Centre.

Nadia Magnenat-Thalmann
Director, CUI
University of Geneva

GAIL
Geneva Artificial Intelligence Laboratory
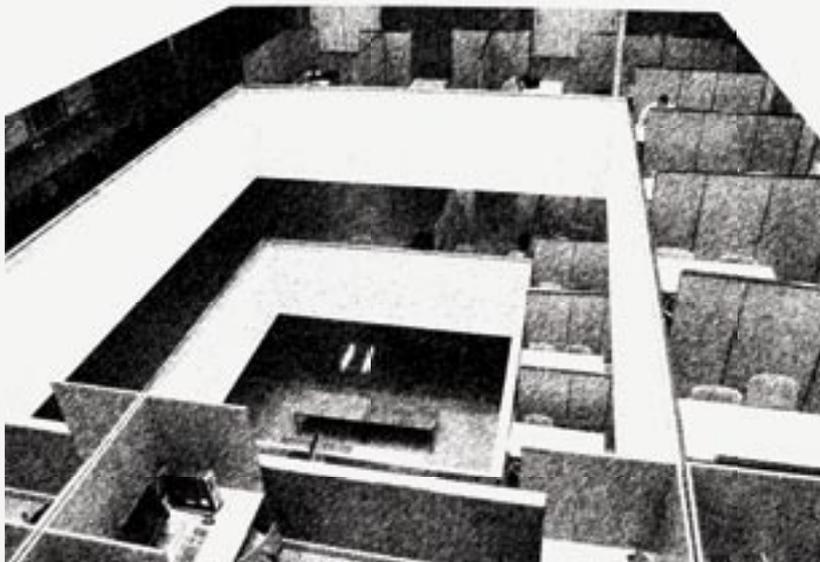
2004 Activity Report

DOMAIN ACTIVITIES

The Geneva Artificial Intelligence Laboratory (GAIL) has been established in 1980. GAIL carries out research activities on both theoretical and applied artificial intelligence.

In the past, research projects have focused on the theory of knowledge representation formalisms and reasoning mechanisms, such as the non-classical logics (modal and epistemic logics) and inferences, on the theoretical aspects of the neuro-symbolic systems (hybrid systems), on the knowledge content and extraction for several artificial neural networks (ANN) architectures and on the study of new learning algorithms for ANN.

Current research activities focus on machine learning and data mining, natural language processing and text mining, information retrieval and knowledge management, with applications in sciences - mainly life sciences (bioinformatics) - and engineering.

All the research activities conducted at GAIL have led to PhD dissertations and to a large number of licence-bachelor and diploma-master thesis.

Web: http://cui.unige.ch/AI-group/

TEAM

Director
Christian Pellegrini,
Full professor

Members
Dr. Mélanie Hilario, MER
Dr. Alexandros Kalousis, MA
Dr. James Henderson, MA

PhD students
Gilles Cohen
Frédéric Ehrler
Jee-Hyub Kim
Julien Prados
Ivan Titov
Adam Woznica
Antonio Jimeno Yepes

LIST OF PUBLICATIONS

Refereed papers in international journals

[1] James Henderson (2004). Estimating probabilities for unbounded categorization problems. Neurocomputing. volume 57, pages 77-86.

[2] Melanie Hilario, Alexandros Kalousis, Julien Prados, P. A. Binz (2004). Data mining for mass spectra-based cancer diagnosis and biomarker discovery. Drug Discovery Today: Biosilico. volume 2. number 5. Elsevier, pages 214-222.

[3] Alexandros Kalousis, J. Gama, Melanie Hilario (2004). On data and algorithms: understanding inductive performance. Machine Learning. volume 54. number 3, pages 275-312.

[4] Julien Prados, Alexandros Kalousis, L. Allard, O. Carrette, J. C. Sanchez, Melanie Hilario (2004). Mining mass-spectra for diagnosis and biomarker discovery of cerebral accidents. Proteomics. volume 4. Wiley, pages 2320-2332.

Full refereed papers in Conference Proceedings

[5] G. Cohen, M. Hilario, A. Geissbuhler (2004). Model Selection for Support Vector Classifiers via Genetic Algorithms. An Application to Medical Decision Support. International Symposium on Biological and Medical Data Analysis (ISBMDA-2004). Springer.

[6] Gilles Cohen, Melanie Hilario, Christian Pellegrini (2004). One-class Support vector Machine with a Conformal Kernel. A Case Study in Handling Class Imbalance. Statistical Pattern Recognition (SPR-2004). Lisbon, Portugal.

[7] Gilles Cohen, Melanie Hilario, Hugo Sax, S. Hugonnet, Christian Pellegrini, Antoine Geissbuhler (2004). An Application of One-Class Support Vector Machines to Nosocomial Infection Detection. Medical Informatics (MEDINFO-2004).

[8] James Henderson (2004). Lookahead in Deterministic Left-Corner Parsing. Proc. Workshop on Incremental Parsing: Bringing Engineering and Cognition Together. Barcelona, Spain.

[9] James Henderson (2004). A Neural Network Parser that Handles Sparse Data. H. Bunt, J. Carroll, G. Satta. New Developments in Parsing Technology. Boston. Kluwer.

[10] James Henderson (2004). Discriminative Training of a Neural Network Statistical Parser. Proc. 42nd Meeting of Association for Computational Linguistics. Barcelona, Spain.

[11] James Henderson (2004). Lookahead in Deterministic Left-Corner Parsing. Proc. Workshop on Incremental Parsing: Bringing Engineering and Cognition Together. Barcelona, Spain.

[12] Melanie Hilario, Alex Mitchell, Jee-Hyub Kim, Paul Bradley, Terri Attwood (2004). Classifying protein fingerprints. Proc. 8th Conference on Principles and Practice of Knowledge Discovery in Databases (PKDD-04 Best Paper Award). Pisa, Italy. Springer-Verlag.

[13] Alexandros Kalousis, Julien Prados, Jean-Charles Sanchez, Laure Allard, Melanie Hilario (2004). Distilling classification models from cross-validation runs: an application to mass spectrometry. International Conference on Tools with Artificial Intelligence (ICTAI-05). Boca Raton, FL.

[14] Adam Woznica, Alexandros Kalousis, Melanie Hilario (2004). Kernel-based distances for relational learning. KDD-04 Workshop on Multirelational Data Mining. Seattle, Washington.

International and national advisory committees

• C. Pellegrini, 1.3.1998 - present: member of the Foundation Council of the Swiss Institute of Bioinformatics, representing the Faculty of Sciences of the University of Geneva

• C. Pellegrini, 1.1.2003 - present: member of the Foundation Council of the IDIAP Research Institute, representing the University of Geneva

• C. Pellegrini, 1.1.1997 - 31.12.2004: member (designated by CNRS) of the Scientific Committee of CRIN, Centre de Recherche en Informatique de l'Université de Nancy (France)

• C. Pellegrini, 1.10.1987 - present: member of the Scientific Committee of the "Diplôme Universitaire en Information Documentaire (CESID)" of the University of Geneva, representing the Faculty of Sciences

MEMBER OF CONFERENCE PROGRAM COMMITTEES AND REVIEWING PANELS

• Members of the Artificial Intelligence Laboratory participate regularly in program committees of international conferences; they are also solicited to review papers for journals.

FUNDED RESEARCH PROJECTS : PARTICIPATION TO EUROPEAN PROJECTS

BioMint
"Biological Text Mining"

Period: January 2003 - December 2005

Cost282 - KnowlEst
"Cost Action 282 on Knowledge Exploration in Science and Technology"

Period: 2002 - 2005

FUNDED RESEARCH PROJECTS : PARTICIPATION TO NATIONAL PROJECTS

FunProt
"Knowledge Discovery in Functional Proteomics"

Period: July 2002 - December 2005

PREMS
"Preprocessing Mass Spectral Data for Knowledge Discovery"

Period: October 2004 - December 2005

Combining Machine Learning and Natural Language Processing for Knowledge Discovery in Text Corpora

Period: October 2002 - September 2004

Bridging the Gap between Propositional and First-Order Learning
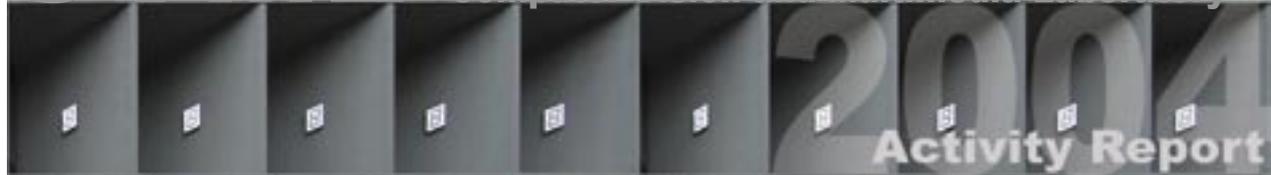
Period: October 2002 - March 2005

Neural Network Statistical Estimation for Very Broad Coverage Parsing

Period: November 2003 - October 2005

OTHERS

• Members of the Artificial Intelligence Laboratory are regularly invited to participate in PhD jury in their respective fields of competences.

CVML

Computer Vision and Multimedia Laboratory
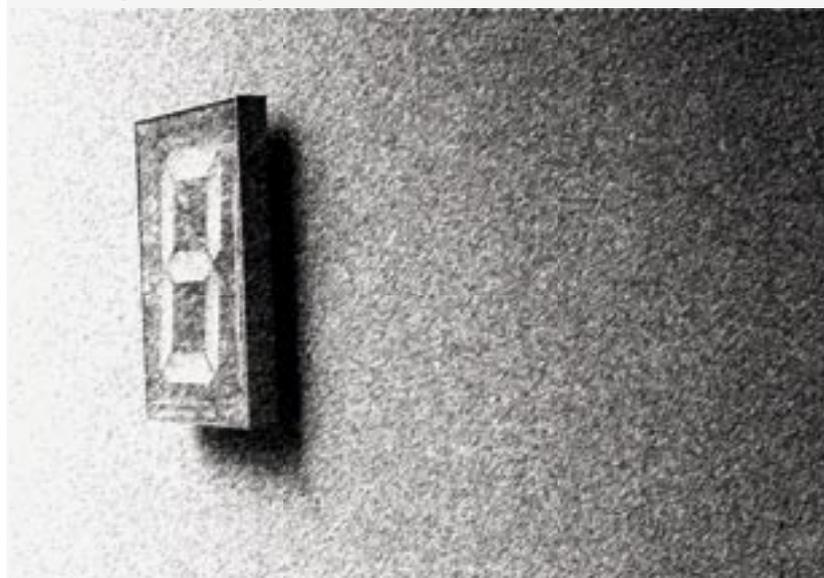
2004 Activity Report

DOMAIN ACTIVITIES

The laboratory carries out research in computer vision, multimedia data processing, management and security, as well as human-machine interaction. Research applies to visual media such as text, audio, images and videos, to sounds, and to physiological signals.

Content-based Visual Indexing and Retrieval group (Viper) (S. Marchand-Maillet): develops strategies for the efficient indexing retrieval and exploration of large multimedia databases. The group studies the complete chain of multimedia management from multimedia processing to content modeling, description and storage and interactive retrieval.

Stochastic Image Processing group (Slava Voloshynovskiy): studies various aspects of information theory and statistical (stochastic) visual data analysis and processing. Applications cover image compression, restoration and denoising, segmentation. A related research axis concerns analog and digital watermarking, authentication, tamper proofing.

Multimodal Interaction group (Thierry Pun): studies several forms of interaction of human with computers and machines. The interaction modalities currently considered are based on physiological signals such as EEGs, as well as on haptic and auditory feedback. An ongoing project aims at the development of an auditory mobility aid for blind people.

Web: http://vision.unige.ch

TEAM

Director
Thierry Pun
Full professor

Sviatoslav Voloshynovskiy
Associate professor

Stéphane Marchand-Maillet
Assistant professor

Members
Dr. Eric Bruno
Dr. Frédéric Deguillaume
Dr. Oleksiy Koval
Dr. Yuriy Rytsar

PhD Students
Teodor Iulian Alecu
Guillaume Chanel
Bruno Janvier
Carlo Jelmini
Serge Kosinov
Oleksiy Koval
Julien Kronegg
Nicolas Moenne-Loccoz
Emre Topak
José Vila Forcen
Renato Villan

PHD THESIS

" Oleksiy Koval, Stochastic image modelling in data hiding applications, October 2004

LIST OF PUBLICATIONS

Refereed papers in international journals

[1] E. Bruno, N. Moenne-Loccoz , S. Marchand-Maillet. Unsupervised Event Discrimination Based on Nonlinear Temporal Modeling of Activity Content. Submitted to the Pattern Analysis and Applications Journal (PAA), Special issue on "Video based event detection". January 2004.

[2] H.Müller, T. Pun, D. McG. Squire, Learning from user behavior in image retrieval: application of the market basket analysis, Int. J. of Comp. Vision, Special Issue on Content-Based Image Retrieval, 56, 1/2, Jan. - Feb. 2004, 65-77.

[3] N. Moenne-Loccoz, E. Bruno and S. Marchand-Maillet.. Knowledge-based Event Detection in Video Streams from Salient Regions of Activity. Submitted to the Pattern Analysis and Applications Journal (PAA), Special issue on "Video based event detection". January 2004.

[4] S. Voloshynovskiy, O. Koval, F. Perez-Gonzalez, K. Mihcak, T. Pun, Data hiding with host state at the encoder and partial side information at the decoder, Accepted to IEEE Trans. Signal Processing, Dec. 2004.

Patents

[5] F. Deguillaume, S. Voloshynovskiy, T. Pun,, A character and vector graphics watermark for text document security, US Patent Application 10/949,318, filed September 27, 2004.

[6] F. Deguillaume, S. Voloshynovskiy, T. Pun, A method for the estimation and recovering of general affine transforms}, US Patent Application USPTO 10/051,808, filed January 17, 2002. Published 17 Jul 2003, Publ nr US-2003-0133589-A1, Patent accepted, issued June 7, 2005.

Full refereed papers in Conference Proceedings

[7] T. I. Alecu, S. Voloshynovskiy, T. Pun, EEG cortical imaging: a vector field approach for Laplacian denoising and missing data estimation, ISBI 2004, 2004 IEEE International Symposium on Biomedical Imaging: From Nano to Macro, April 15-18, 2004, Arlington, VA, USA.

[8] T. I. Alecu, S. Voloshynovskiy, T. Pun, Regularized two-step brain activity reconstruction from spatio-temporal EEG data, SPIE Int. Symp. Optical Science and Technol., Conf. Image Reconstruction from Incomplete Data III (AM320), 2-6 August 2004, Denver, Colorado, USA.

[9] T. I. Alecu, S. Voloshynovskiy, T. Pun, Localization properties of an EEG sensor system: lower bounds and optimality, EUSIPCO-2004, 12th Eur. Signal Proc. Conf., Sept. 7-10, 2004, Vienna, Austria.

[10] C. Jelmini, S. Marchand-Maillet. OWL-based reasoning with retractable inference, in RIAO 2004, conference on Coupling approaches, coupling media and coupling languages for information retrieval, Avignon, France, April 2004.

[11] S. Kosinov, S. Marchand-Maillet, T. Pun, Iterative majorization approach to distance-based discriminant analysis, in: Classification: The Ubiquitous Challenge (Gesellschaft für Klassification, GfKl'04), Dortmund, Germany, March 9-11, 2004.

[12] S. Kosinov and S. Marchand-Maillet. Distance-based Discriminant Analysis for pattern classification. Workshop EUNITE 2004. Aachen, Germany, June 2004 (invited paper).

[13] S. Kosinov, S. Marchand-Maillet, Global knowledge learning for multimedia autoannotation, ICPR Workshshop LAVS, Cambridge, UK, August 2004.

[14] S. Kosinov, S. Marchand-Maillet, Hierarchical ensemble learning for multimedia categorization and autoannotation, IEEE Machine Learning and Signal Processing, Brazil, September 2004.

[15] S. Kosinov, S. Marchand-Maillet, T.Pun, Visual object categorization using distance-based discriminant analysis}, 4th Int. Workshop on Multimedia Data and Document Engineering (MDDE-04), July 2nd 2004, In conjunction with IEEE Computer Society Conference on Computer Vision and Pattern Recognition, CVPR 2004, Washington, DC, USA, 27th June - 2nd July, 2004.

[16] O. Koval, S.Voloshynovskiy, F. Perez-Gonzalez, F. Deguillaume, and T. Pun, Spread Spectrum Watermarking for Real Images: Is Everything So Hopeless?, XIIth European Signal Processing Conference EUSIPCO 2004, Vienna, Austria, September 07 - 10, 2004.

[17] O. Koval, S.Voloshynovskiy, F. Perez-Gonzalez, F. Deguillaume, and T. Pun, Quantization-based watermarking performance improvement using host statistics: additive noise attack, ACM Multimedia and Security Workshop Magdeburg, Germany, September 20-21, 2004.

[18] S. Marchand-Maillet. Visual Collection Guiding. Dagsthul Seminar on Content-based Retrieval. Schloss Dagsthul, Germany, Jan. 2004.

[19] N.Moenne-Loccoz, E. Bruno, S. Marchand-Maillet. Video Content Representation as Salient Regions of Activity. International Conference on Image and Video Retrieval (CIVR 2004), Dublin, IE, July 2004.

[20] N. Moenne-Loccoz, B. Janvier, E. Bruno, S. Marchand-Maillet. Managing Video Collections at Large. ACM SIGMOD Workshop on "Computer Vision meets Databases". Paris, France, June 2004.

[21] H. Müller, A Geissbühler, S. Marchand-Maillet and P. Clough. Benchmarking Image Retrieval Applications. In Visual Information Systems (VIS2004). San Francisco, 8-10 September 2004 (invited).

[22] V. Pallotta, A. Ballim, S. Marchand-Maillet and A. Lisowska, Towards Meeting Information Sytems: Meeting Knowledge Management, in International Conference on Enterprise Information Sytems (ICEIS 04), Porto, Portugal, 14-17 April 2004.

[23] L. Perez-Freire, F. Perez-Gonzalez and S. Voloshynovskiy, Revealing the true achievable rates of scalar Costa scheme, IEEE International Workshop on Multimedia Signal Processing, Siena, Italy, Sept 29 - Oct 1, 2004.

[24] Y. Rytsar, S. Voloshynovskiy, F. Ehrler and T. Pun, Interactive segmentation with hidden object based annotations: towards smart media, SPIE Electronic Imaging, Storage and Retrieval Methods and Applications for Multimedia 2004, 18-22 January 2004, San Jose, California, USA.

[25] E. Topak, S. Voloshynovskiy, O. Koval and T. Pun, Capacity-security analysis of repetitive watermarking, XIIth European Signal Processing Conference EUSIPCO 2004, Vienna, Austria, September 07 - 10, 2004.

[26] J. Vila, O. Koval and S. Voloshynovskiy, Distributed Single Source Coding with Side Information, SPIE Electronic Imaging 2004, Visual Communications and Image Processing, 18-22 January 2004, San Jose, California, USA.

[27] J. Vila, S.Voloshynovskiy, O. Koval, F. Perez-Gonzalez and T. Pun, Worst case additive attack against quantization-based watermarking techniques, IEEE International Workshop on Multimedia Signal Processing, Siena, Italy, Sept 29 - Oct 1, 2004.

[28] S. Voloshynovskiy. O. Koval, F. Deguillaume and T. Pun, Visual communications with side information via distributed printing channels: extended multimedia and security perspectives, Conf. on Security, Steganography, and Watermarking of Multimedia Contents VI, Special session "Document security", S. Voloshynovskiy, chair, part of the IST/SPIE Symposium on Electronic Imaging 2004, Jan 18-22, 2004, San Jose, CA, USA, paper EI 5306-43.

Research and technical reports

[29] T. I. Alecu, S. Voloshynovskiy, T. Pun, Regularized two-step brain activity reconstruction from spatio-temporal EEG data, Joint AMI - PASCAL - (IM)2 - M4 Workshop on Multimodal Interaction and related machine learning algorithms, Martigny, Switzerland, 21-23 June 2004 (poster).

[30] S. Kosinov, "Distance-based Discriminant Anyalysis", SIMILAR WP6&9 meeting, EPF-Lausanne, May 25-26, 2004.

[31] O. Koval, "Distributed Single Source Coding", SIMILAR WP6&9 meeting, EPF-Lausanne, May 25-26, 2004.

[32] O. Koval, "Distributed Single Source Coding with Side Information" IM2 Summer Institute, Martigny, June 22, 2004.

[33] S. Marchand-Maillet. Collection Guiding: 2- Theoretical developments. Technical report number No. 04.01, Computer Vision and Multimedia Laboratory, Computing Centre, University of Geneva, rue General Dufour, 24, CH-1211, Geneva, Switzerland, 2004.

[34] N. Moenne-Loccoz. Video content decomposition for efficient indexing. Technical report number No. 04.02, Computer Vision and Multimedia Laboratory, Computing Centre, University of Geneva, rue General Dufour, 24, CH-1211, Geneva, Switzerland, 2004.

[35] Y. Rytsar, S. Voloshynovskiy, O. Koval, T. Pun (Unige/CVML) : Information-Theoretic Visual Communications in Human-Computer Interfaces : Interactive Segmentation. Poster session at the IM2.SIAB, Feb. 12, 2004, 2004, Martigny.

[36] Y. Rytsar, S. Voloshynovskiy, O. Koval, F. Deguillaume, J. Vila, T. Pun, "Smart Media: from basic concept to applications", IM2 Summer Institute. Martigny, June 22, 2004.

[37] J. Vila, "Distributed Single Source Coding with Side Information" at ETH Zentrum, IM2.SA Workshop, April 23, 2004.

[38] S. Voloshynovskiy, O. Koval, J. E. Vila Forcen, Y. Rytsar and T. Pun. "The Role of Non-Perfect Side Information in Multimodal Communications", SIMILAR WP6&9 meeting, 8-9.11.2004, Nice, France.

CONFERENCE ORGANIZATION AS CHAIR OR CO-CHAIR

- EUSIPCO 2004, Europ. Conf. Signal Processing, Session Chair, Sept. 2004, Vienna, Austria.

MEMBER OF CONFERENCE PROGRAM COMMITTEES

- ICPR 2004, Int. Conf. Pattern Recognition, August 2004, Cambridge, UK.

- MLMI 04 - Machine Learning for Multimodal Interfaces, June 2004, Martigny, Switzerland.

- IEEE ICIP 2004, Int. Conf. Image Processing, Oct. 2004, Singapore.

- MediaNet 2004, Nov. 2004, Tunisia.

- European Digital Library Conference (ECDL 2004), UK

- Multimedia Document and Data Engineering (MDDE 2004), USA

- Conference on Adaptive Multimedia Retrieval (AMR 2004), ES

- Conference on Image and Video Retrieval (CIVR 2004), IR

- IEEE International Workshop on Multimedia Signal Processing MMSP2004, Siena, Italy, September 29- October 1, 2004 (program committee)

- International Workshop on Digital Watermarking IWDW2004, Seoul, Korea, October 30- November 1, 2004 (program committee)

- ACM Multimedia and Security Workshop 2004, Magdeburg, Germany, September 20-21, 2004 (program committee)

- Electronic Imaging 2004, Multimedia security and watermarking VI, Santa Clara, USA, January, 2004 (organizer and chairman of special session on Security and Protecton of Printed Documents)

INVITED TALKS

- S. Marchand-Maillet, Distance-based Discriminant Analysis for pattern classification (Workshop EUNITE 2004), Aachen, Germany, 2004

- S. Marchand-Maillet, Principles of Collection Guiding. Seminar on Content-based Multimedia Information Retrieval, Dagstuhl, Germany, January 2004

- H. Müller, A. Geissbuhler, S. Marchand-Maillet and Paul Clough, Benchmarking Image Retrieval Applications (Visual Information Systems VIS2004), San Francisco, USA, 2004

FUNDED RESEARCH PROJECTS :
PARTICIPATION TO EUROPEAN PROJECTS

SIMILAR
"Seamless integrated multimodal interfaces for learning and augmenting communication in the real world: The European taskforce in future human-machine interfaces research"

Period: December 2003 - November 2007

ECRYPT
"European network of excellence in cryptology"

Period: February 2004 - January 2008

M4
"Multimodal meeting manager"

Period: March 2002 - February 2005

WebKit
"Intuitive physical interfaces to the WWW"

Period: March 2002 - May 2004

FUNDED RESEARCH PROJECTS :
PARTICIPATION TO NATIONAL PROJECTS

CRYMEDA-SA -

A CRYstal Marking based Encryption and Document Authentication Security Architecture for brand protection

Period: December 2002 - March 2004

Project IM2.IIR

"Information indexing and retrieval"

Period: January 2004 - December 2005

Project IM2.SA

"Scene analysis"

Period: May 2004 - December 2005

Project IM2.BMI

"Brain machine interface"

Period: July 2004 - December 2005

Project IM2.SA

"Scene analysis"

Period: May 2002 - April 2004

Project IM2.BMI

"Brain machine interface"

Period: July 2002 - June 2004

Project IM2.ASIM

"Applied stochastic image modeling"

Period: July 2002 - June 2004

Intelligent multimedia description authoring framework
FNRS-SNSF, Swiss National Science Foundation

Period: October 2004 - September 2006

Direct non-invasive Human Brain Machine Interfaces,
FNRS-SNSF, Swiss National Science Foundation

Period: April 2003 - April 2006

Intelligent multimedia description authoring framework,
FNRS-SNSF, Swiss National Science Foundation

Period: April 2002 - March 2004

SNF Professorship grant
"Stochastic detection of hidden data"
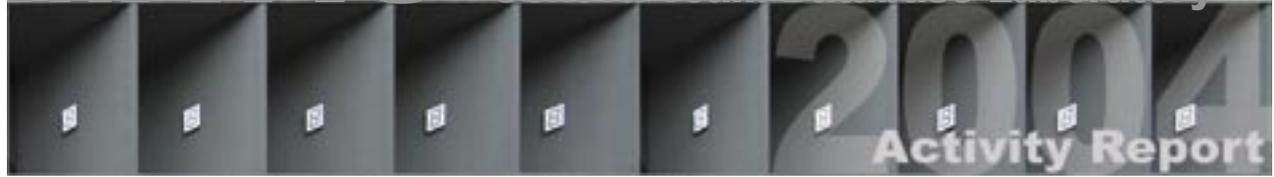
Period: April 2003 - April 2007

SPINOFF

• Anteleon Imaging S.A.R.L. (founded August 2003, http://www.anteleon.com/), specialized in multimedia documents protection and management, watermarking, authentication and tamper proofing.

OTHERS

• Editorial Board, Computerized Medical Imaging and Graphics, Pergamon (T. Pun).

• August 19, 2004: S. Marchand-Maillet. TSR1 T.J.19:30: News Report on Google. Acted as field expert.
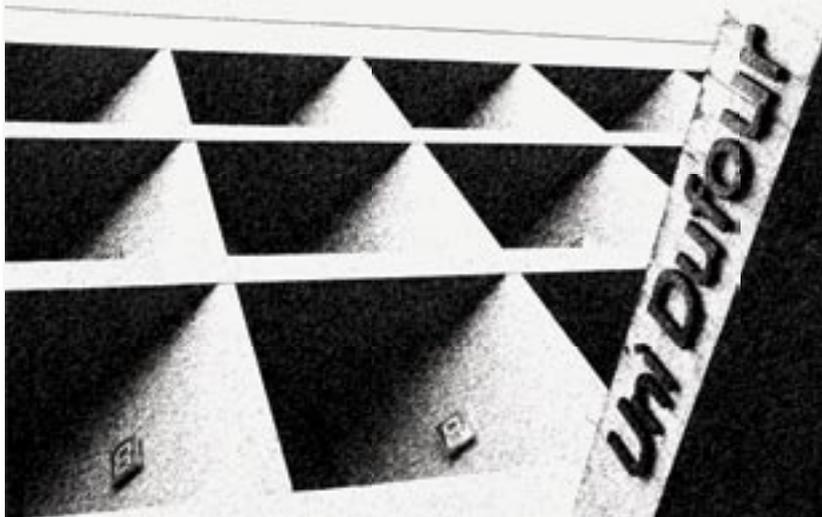
MATIS
Geneva Team Database Laboratory
2004 Activity Report

DOMAIN ACTIVITIES

Our researches are focused mainly on information systems in its different aspects. Basically three main areas represent our research trends. The first is the information system evolution. It concerns the integration of new needs of information systems in legacy IS. Such approach regroups different fields of research such as the IS components, Static and Dynamic aspects integration and Ontology. The second area of interest is the distributed information system design and implementation. In this area, we focused on the different interactions and knowledge overlap between the IS project partners. Finally, the third area is the methods components.

Web: http://matis.unige.ch

TEAM

Director
Michel Léonard
Full professor

Members
Dr Snene Mehdi
Dr Le Dinh Thang
Dr Ralyte Jolita

Phd Students
Pardellas Jorge
Khadraoui Abdelaziz
Arni-bloch Nicolas
Turki Slim
Pham Thoa

PhD Thesis

- Thang Le Dinh, Information Systems upon Information Systems, November 2004

- Nicholas Crofts, Museum informatics: the challenge of integration, December 2004

- Mehdi Snene, Knowledge patterns of distributed information systems: the case of distribution design and implementation based on integrity constraints optimization, December 2004

List of publications

Full refereed papers in Conference Proceedings

[1] Towards coordination-ready information systems: the Information System Component approach, T.Le Dinh, M.Léonard, Proceeding of the International Conference on Advances in Intelligent Systems - Theory and Applications in cooperation with IEEE Computer Society - AISTA'2004, Luxembourg, November 2004.

[2] Information system architectures : where are we ?, Snene M., Pardellas J., Léonard M., Proceedings of the international conference on information and communication technologies, IEEE Proceedings, Syrie, 2004.

[3] Khadraoui, S.Turki, C. Aïdonidis, M. Léonard , "Institutional Information Systems Alignment on Laws ", AISTA 2004, International Conference on Advances in Intelligent Systems - Theory and Applications, In cooperation with the IEEE Computer Society, Luxembourg, November 15-18, 2004.

[4] Khadraoui, C. Aïdonidis, S.Turki, M. Léonard , "Ré-ingénierie des Systèmes d'Informations Institutionnels", Conférence Internationale sur les Systèmes Complexes (CISC'2004), Algérie, 6-8 septembre 2004.

[5] S.Turki , C. Aïdonidis , A. Khadraoui, , M. Léonard , "Towards Ontology-Driven Institutional IS Engineering", Open INTEROP Workshop On "Enterprise Modelling and Ontologies for Interoperability"; EMOI - INTEROP 2004; Co-located with CaiSE'04 Conference, Riga (Latvia), 7-8 june 2004.

[6] Khadraoui, M. Léonard, "Component Based Information System Re-engineering Approach", International Conference on Entreprise Information Systems, ICEIS'2004, Porto, Portugal, 2004.

Research and technical reports

[7] A . Khadraoui, " Ré-ingénierie des Systèmes d'Information Institutionnels : les fondements théoriques", Journées MATIS'04, Grenoble, France, April, 2004.

Conference organization as chair or co-chair

- Geneva Exchange Forum, Chair, Interop, Geneva 12-16 July

- First European Conference on Interoperability-Enterprise Software Applications, Chair

Member of conference program committees

- CAISE

- INFORSID

- AIM

Funded research projects :

Participation to National projects

Knowledge pattern for pattern distributed information system design and implementation

Period: 2004 - 2006

Methods components for IS design

Period: 2004 - 2006

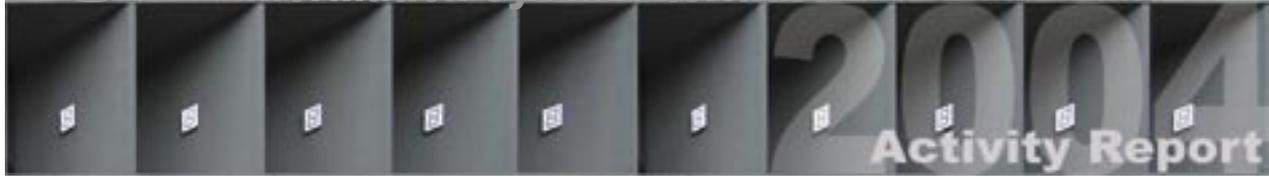### Magiconf
Scientific conferences management tool

Period: 2004

Modelling based approach for information system reengineering

Period: April 2003 - April 2006

Interop
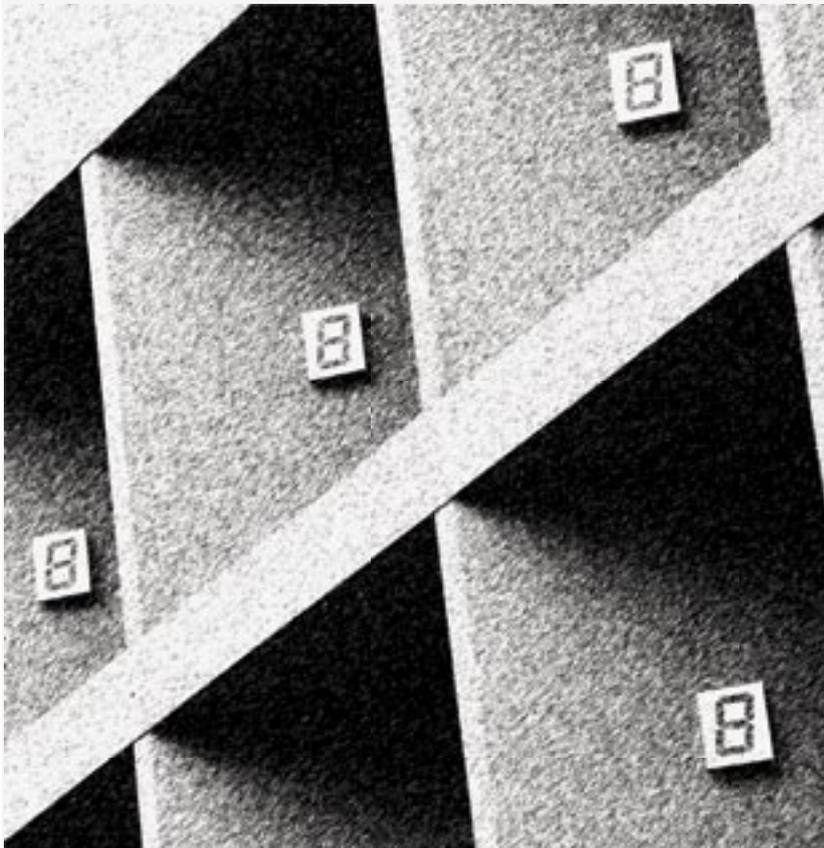*European network of research on Information system Interoperability*

Period: January 2004 - 2006

DOMAIN ACTIVITIES

Current research directions of the ISI group include: models and tools to develop and maintain multi-point of view ontologies models and systems for managing virtual documents, in particular virtual hyperbooks techniques to integrate ontologies, and their application to the generation of interfaces for accessing digital libraries contextual interfaces for information retrieval systems

Web: http://cui.unige.ch/isi

TEAM

Director
Dr. Gilles Falquet
Associate Professor

Members
Jacques Guyot
Luka Nerima

Phd Students
Claire-Lise Mottaz
Jean-Claude Ziswiler
El Mustapha El Atifi
Saïd Radhouani
Gabriela Tissiani
Kaveh Bazargan

LIST OF PUBLICATIONS

Refereed papers in international journals

[1] Gilles Falquet, Luka Nerima, Jean-Claude Ziswiler. Utilisation des ontologies dans les environnements d'écriture collaborative d'hyperlivres, expériences et perspectives. In Jacqueline Bourdeau, Michel Crampes (Éds.) Que signifie l'ontologie pour les EIAH ? Revue STICEF, Volume 11, 2004.

Full refereed papers in Conference Proceedings

[2] Jean-Claude Ziswiler, Gilles Falquet, Luka Nerima. Integration of Hyperbooks into the Semantic Web. In Proceedings of the 2nd International Workshop on Applications of Semantic Web Technologies for E-Learning (SW-EL'04), Applications of Semantic Web Technologies for E-Learning session at the 3rd International Semantic Web Conference (ISWC2004), Hiroshima, Japan, November 7-11, 2004.

[3] Gilles Falquet, Claire-Lise Mottaz-Jiang, Jean-Claude Ziswiler. Ontology Based Interfaces to Access a Library of Virtual Hyperbooks. In Proceeding of the 8th European Conference on Digital Libraries (ECDL 2004), Bath, UK, September 12-17, 2004. In: Rachel Heery, Liz Lyon (Eds.) Research and Advanced Technology for Digital Libraries, Lecture Notes in Computer Sciences (LNCS), vol. 3232, Springer, Berlin, Germany, 2004.

[4] Gilles Falquet, Luka Nerima, Jean-Claude Ziswiler. Adaptive Mechanisms in a Virtual Hyperbook. In Proceeding of the 4th IEEE International Conference on Advanced Learning Technologies (ICALT2004), Joensuu, Finland, Aug. 30 - Sept. 1, 2004.

[5] Gilles Falquet, Luka Nerima, Jean-Claude Ziswiler. Towards Digital Libraries of Virtual Hyperbooks. In Proceedings of the Fifteenth ACM Conference on Hypertext and Hypermedia (Hypertext'04), Santa-Cruz, USA, August 2004.

[6] Saïd Radhouani and Jean-Pierre Chevallet and Mathias Géry. Extraction et indexation de chemins de lecture pour la Recherche d'Information sur le WEB. Eight Maghrebian Conference on Software Engineering and Artificial Intelligence (MCSEAI'04), Sousse, Tunisie, 9-12 mai, 2004.

[7] Saïd Radhouani and Jean-Pierre Chevallet and Mathias Géry. Un modèle à base de chemin de lecture pour la Recherche d'Informations précises sur le Web. CORIA'04, Toulouse, France, 10-12 Mars, 2004.

[8] Gilles Falquet, Claire-Lise Mottaz-Jiang, Jean-Claude Ziswiler. Intégration d'ontologies pour l'accès à une bibliothèque d'hyperlivres virtuels. In Proc. 14ème Congrès Francophone AFRIF-AFIA de Reconnaissance des Formes et Intelligence Artificielle (RFIA 2004), Toulouse, France, Janvier 2004.

Research and technical reports

[9] EL Mustapha El Atifi et Gilles Falquet. Spécification des interfaces 3D pour la visualisation des bases de connaissances.

[10] EL Mustapha El Atifi et Gilles Falquet. Generating 3D interfaces to visualise knowledge bases.

[11] Jean-Claude Ziswiler, Gilles Falquet. Ontologies and Ontology Mapping for Supporting Student Assessment in an Advanced Learning System.

[12] J. Guyot, G. Falquet, C.-L. Mottaz Jiang, S. Radhouani. Analysing, Converting and Publishing the UNL Knowledge Base

Software and Services

[13] G. Falquet, J. Guyot. The Lazy hypertext view system. http://sourceforge.net/projects/lazy-x/

[14] W. Muller. The International UNL Resource Index (UNL Universe) http://cui.unige.ch/isi/unl/

INTERNATIONAL AND NATIONAL ADVISORY COMMITTEES

• Gilles Falquet, 2000-2002, member of the CHOOSE executive board (Swiss Group for Object-Oriented Systems and Environments)

• Gilles Falquet, Membre du comité scientifique de la revue Techniques et Sciences Informatiques (TSI), Paris, depuis 2003.

INVITED TALKS

• Gilles Falquet, Introduction au Web sémantique (GIEE), Monastir, Tunisie

FUNDED RESEARCH PROJECTS :
PARTICIPATION TO NATIONAL PROJECTS

Models and languages to design and speicify interactive three dimensional interfaces for knowledge bases

Period: 2004 - 2006

Development of advanced text mining tools

Period: 2004 - 2005

Facilitating Communication Between Languages and Cultures: A Computerized Interface and Knowledge Base (RUIG)

Period: 2003 - 2005

Development of advanced document search tools (CTI project)

Period: 2003 - 2005

TECHNOLOGY TRANSFER

• Technology transfer agreement with Metaread S.A. company for the development of knowledge-based document management systems (multilingual indexing, retrieval and aligment of texts, automatic classification, terminology management). This agreement includes the payement of royalties on products derived from the transfered technology.
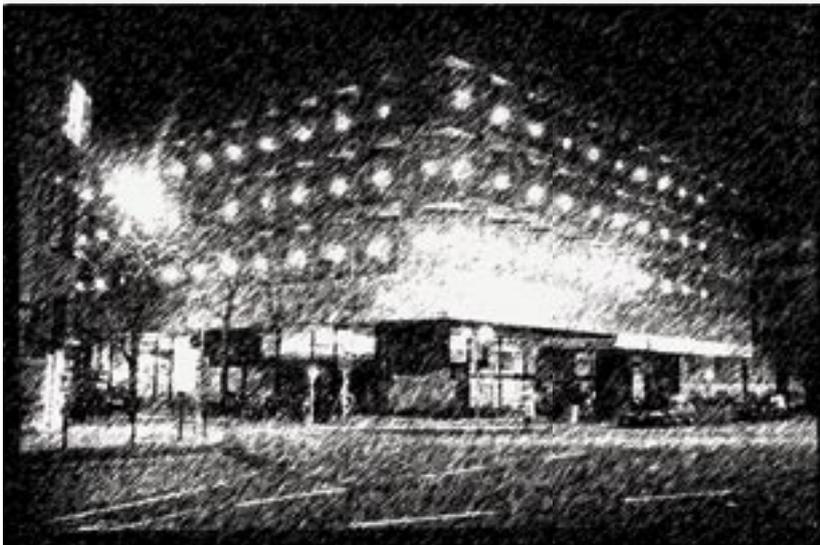
DOMAIN ACTIVITIES

The LATL develops research and prototypes for several facets of natural language processing. The main areas of research are automatic analysis of sentence structure (parsing) and its meaning, and the development of lexicons and dictionaries. Parsing is at the core of several applications: text-to-speech, terminological extraction, computer-assisted language learning, text mining, and automatic translation. The successful performance of these applications lies in accurate, extensive and detailed information about words. We study machine learning techniques for learning dictionaries, and parse text to automatically treat collocations (fixed sequences of words) to support translation. The systems developed at LATL span several languages: French, English, German, Italian, and other languages are underway (Greek, Spanish).

Web: http://www.latl.unige.ch

TEAM

Director
Eric Wehrli,
Full professor

Members
Dr. Paola Merlo
Dr. Christopher Laenzlinger
Luka Nerima
Jean-Philippe Goldman
Dr. Anne Vandeventer Faltin

PhD Students
Gabriele Musillo
Antonio Leoni de Leon
Violeta Seretan
Gabriela Soare
Mar Ndiaye
Athina Michou
Sébastien L'haire

LIST OF PUBLICATIONS

Refereed papers in international journals

[1] Mar Ndiyae, Anne Vandeventer Faltin, 2004. "Correcteur orthographique adapté à l'apprentissage du français ", BULAG (Bulletin de linguistique général et appliquée), n° 29, p. 117-134

[2] Chrisopher Laenzlinger . 'French Adjective Ordering: Perspectives on DP-internal Movement Types', Lingua. 115/5, 645-689.

Full refereed papers in Conference Proceedings

[3] Sébastien L'haire. "Vers un feedback plus intelligent. Les enseignements du projet Freetext". Proceedings of the Journée d'étude de l'ATALA. NLP and Language Learning. pp. 1-12, 2004.

[4] Gerold Schneider. "Combining Shallow and Deep Processing for a Robust, Fast, Deep-Linguistic Dependency Parser". ESSLLI 2004 Workshop on Combining Shallow and Deep Processing for NLP, Nancy, France, 2004.

[5] Violeta Seretan, Luka Nerima, Eric Wehrli."Using the Web as a Corpus for the Syntactic-Based Collocation Identification", Proceedings of International Conference on Language Resources and Evaluation (LREC 2004), Lisbon, Portugal, pages 1871-1874,2004.

[6] Violeta Seretan, Luka Nerima, Eric Wehrli, "A Tool for Multi-Word Collocation Extraction and Visualization in Multilingual Corpora." Proceedings of the Eleventh EURALEX International Congress (EURALEX 2004), Lorient, France, pages 755-766,2004.

[7] Eric Wehrli. "Traduction, traduction de mots, traduction de phrases", in B. Bel and I. Marlien, Proceedings of the XI Conference on the Automatic Processing of Natural Language (TALN), 483-491,2004.

Books and book chapters

[8] Laenzlinger, Christopher, 'The Feature-based Theory of Adverb Syntax'. Dans Austin, Jennifer R., Stefan Engelberg, Gisa Rauh (éds). Adverbials. The Interplay between Meaning, Context and Syntactic Structure. Amsterdam, Philadelphia: Benjamins, 2004, 205-252.

[9] Violeta Seretan, Luka Nerima, Eric Wehrli, "Multi-word collocation extraction by syntactic composition of collocation bigrams." Nicolas Nicolov, Kalina Bontcheva, Galia Angelova and Ruslan Mitkov (Eds.), Recent Advances in Natural Language Processing III: Selected Papers from RANLP 2003. Amsterdam & Philadelphia: John Benjamins, Current Issues in Linguistic Theory, 260, 2004, 91-100.

[10] Eric Wehrli "Un modèle multilingue d'analyse syntaxique." A. Auchlin, M. Burger, L. Filliettaz, A. Grobet, J. Moeschler, L. Perrin, C. Rossari and L. de Saussure (Eds.), Structures et discours, Mélanges offerts à Eddy Roulet, Montréal, Nota bene, 2004, 311-329.

Research and technical reports

[11] Jean Philippe Goldman, "Calibrating the prosody in a TTS engine front end." AT&T Research, NJ, Final report of NSF fellowship for junior researchers.

[12] Eric Joanis. "Learner 2 Technical Report: Token-Wise Verb Class Disambiguation." Technical Report Textmining-4, LATL, Project NSF 2051-068142.02, University of Geneva, October 2004.

[13] Gerold Schneider, 2004. "Thematic FrameNet Role and Verb Class Learner (aka Learner 1)". Technical Report Textmining-3, LATL, NFS grant 2051-068142.02, University of Geneva, September 2004.

[14] Eric Wehrli, Luka Nerima, Violeta Seretan, Project RUIG-GIAN (Réseau universitaire international de Genève - Geneva International Academic Network) "Analyse linguistique et extraction de collocations" - Final Report, January 2004

INTERNATIONAL AND NATIONAL ADVISORY COMMITTEES

• Paola Merlo, Member of the Advisory Board for the European Chapter of the Association for Computational Linguistics, 2004-2006.

CONFERENCE ORGANIZATION AS CHAIR OR CO-CHAIR

• Paola Merlo, Co-chair, tutorials session, International Conference on Computational Linguistics (Coling 2004), Geneva, Switzerland, August 2004.

MEMBER OF CONFERENCE PROGRAM COMMITTEES

• Paola Merlo, International Conference on Linguistic Evidence: Empirical, Theoretical and Computational Perspectives, Tübingen, Germany, January 2004.

• Christopher Laezlinger, Chronos, September 2004, Geneva.

INVITED TALKS

• Sébastien L'haire, FreeText: a prototype for teaching French as a second language using NLP tools (un prototype d'enseignement du FLE comportant des outils de TALN). Day "Cognition in the Rhône-Alpes Region", Rhône-Alpes Network of Cognitive Science. Grenoble, 17 december 2004.

• Jean-Philippe Goldman, Speech Tools Department of Computer Science, University of Columbia, NY, March 2004.

• Christopher Laenzlinger, On Merging Positions for Arguments and Adverbs in the Romance Mittelfeld, University of Venice, February 2004.

• Christopher Laenzlinger, Le rôle des interfaces morphologique, sémantique et informationnelle dans un modèle comparatif d'analyses linguistiques, University of Neuchâtel, March 2004.

• Paola Merlo, Empirical Methods in (Computational) Linguistics. Series of 3 lectures, Department of Language Sciences, University of Venice, February 2004.

• Paola Merlo, Human and Automatic Classification and Disambiguation, Series of 3 lectures. Department of Communication Sciences, University of Siena, March 2004.

• Paola Merlo, Issues in Multi-lingual Automatic Verb Classification, Department of Informatics, University of Edinburgh, April 2004.

• Paola Merlo, Issues in Multi-lingual Automatic Verb Classification, Department of Informatics, University of Sussex, May 2004.

• Eric Wehrli and Luka Nerima, Oberon for Natural Language Processing, Oberon Day @ CERN: Conference in honour of Niklaus Wirth, CERN, Geneva, Switzerland, 2004.

• Eric Wehrli, Vers un modèle multilingue d'analyse syntaxique, ACFAS, Montréal, May 2004.

FUNDED RESEARCH PROJECTS :

PARTICIPATION TO NATIONAL PROJECTS

Combining Machine Learning and Natural Language Processing for Knowledge Discovery in Text Corpora

Period: 2002 - 2004

Analyse multilingue : généricité et diversité

Period: 2003 - 2005

Weakly Supervised Learning of Verb Meaning,

Period: 2004 - 2006

Développement d'un modèle plurilingue de traitement des langues naturelles

Period: 2004 - 2006

SPINOFF

• LATL.ch S.A. is a technology start-up specialized in the development of linguistic software components. Closely associated with the language technology laboratory of the University of Geneva, LATL. ch develops and commercializes products based on fundamental research conducted in the university lab. Two speech synthesis companies use its phonetizer product: Acapela Group, a European group, and SVOX, a start-up located in Zürich.

OTHERS

Editorial responsibilities

• Paola Merlo, member of the editorial board of Computational Linguistics, MIT Press.

• Paola Merlo, editor of the Journal of Logic, Language and Information, Springer Verlag.

Public exhibitions and performances

• Violeta Seretan, Syntactic-Based Collocation Extraction from Parallel Corpora and from the Web. Presentation at Ecole doctorale lémanique en sciences du langage, 6 May 2004, University of Geneva

• Gabriel Musillo, Formal Aspects of the FIPS parser, Ecole doctorale lémanique en Sciences du Langage, University of Geneva, April 2004

• "Extraction des collocations à partir du Web" - system demonstration at Journée Portes Ouvertes de l'Informatique/ Semaine de l'Informatique Plurielle, 27 November 2004, Centre universitaire d'informatique (CUI), University of Geneva

• Jean-Philippe Goldman and Eric Wehrli took part in an evaluation campaign for French syntactic parsers. EVALDA EASY, http://www. technolangue.net/article64.html
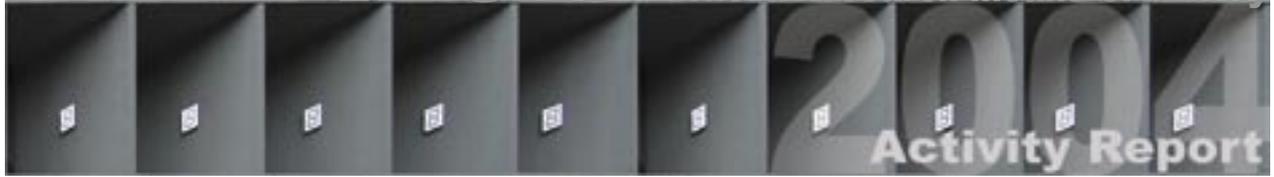
Refereeing

• Paola Merlo refereeing for International Joint Conference in NLP, Hainan Island, China.

• Christopher Laenzlinger referreing for Probus and US NSF.

MIRALab

Where Research means Creativity

2004 Activity Report

DOMAIN ACTIVITIES

MIRALab was founded in 1989 by Professor Nadia Magnenat-Thalmann and is composed of more than 30 researchers coming from many different fields, such as computer science, mathematics, medical field, design, architecture, fashion design, cognitive science, etc. The group is truly interdisciplinary, working in the field of computer graphics, computer animation and virtual worlds. Since 1992 the group has participated in more than 30 European Projects; In 2004, MIRALab was working on 12 projects: LIFEPLUS, EPOCH, STAR, MUHCI, ISIS, WebDance, COME, ERATO, AIM@Shape, ENACTIVE, DANAE, HUMAINE. International conferences are often organised in Switzerland by MIRALab. Moreover, MIRALab participates in different manifestation such as fashion defiles with virtual models and clothes.

Web: http://www.miralab.unige.ch

TEAM

Director:
Nadia Magnenat-Thalmann
Full professor

Members:
Laurent Moccozet (MER)
Azam Bastanfard (PD)
HyungSeok Kim (PD)
Pascal Volino (PD)
Stephane Garchery (PD)

Assistants:
Alessandro Foni
Arjan Egges
Benjamin Gilles
Caecilia Charbonnier
Christiane Luible
Clementine Lo
Dimitris Protopsaltou
Etienne Lyard
Fabien Dellas
Georgios Papagiannakis
Lionel Egger
Lydia Yahia-Cherif
Marlene Arevalo-Poizat
Mélanie Montagnol
Michel Gaudry
MyungJin Kang
Nedjma Cadi-Yazli
Rajeev Gupta
Sophie Jarlier
Thomas Di Giacomo
Ugo Bonanni
Yacine Benmansour

PhD Thesis

- Stéphane Garchery, Animation faciale temps réel multi plates-formes, September 2004

- Frederic Cordier, Real-time animation of dressed virtual Humans, January 2004

List of publications

Refereed papers in international journals

[1]   H. Kim, T. Di Giacomo, A. Egges, E. Lyard, S. Garchery, N. Magnenat-Thalmann "Believable Virtual Environment: Sensory and Perceptual Believability", Believability in Virtual Environment, December 2004

[2]   N. Magnenat Thalmann, H. Seo, F. Cordier "Automatic Modeling of Virtual Humans and Body Clothing", Journal of Computer Science and Technology, Vol. 19 No. 6, in press, Chinese Academy of Sciences, Beijing, China, December 2004

[3]   T. Di Giacomo, C. Joslin, S. Garchery, H. Kim, N. Magnenat Thalmann, "Adaptation of Virtual Human Animation and Representation for MPEG", Elsevier Computer & Graphics, vol.28 no.4, August 2004, pp. 65-74.

[4]   C. Joslin, T. Di Giacomo, N. Magnenat Thalmann, "Collaborative Virtual Environments, From Birth to Standardization", IEEE Communications Magazine, Special Issue on Networked Virtual Environments, vol. 42, pp. 65.74, April 2004

[5]   H. Seo, N. Magnenat Thalmann, "An Example-Based Approach to Human Body Manipulation", Graphical Models, Academic Press, Vol. 66, No. 1, January 2004, pp. 1-23.

Full refereed papers in Conference Proceedings

[6]   Egges, R. Visser, N. Magnenat Thalmann "Example-Based Idle Motion Synthesis in a Real-Time Application", CAPTECH Workshop, Zermatt, Switzerland, pp. 13-19, December 2004

[7]   T. Di Giacomo, H. S. Kim, S. Garchery, N. Magnenat Thalmann, D. Cailliere, G. Belay, A. Cotarmanac'h, T. Riegel."Benchmark-Driven Automatic Transmoding of 3D to 2D Talking Heads", Workshop on Modelling and Motion Capture Techniques for Virtual Environments, December 2004

[8]   L. Moccozet, F. Dellas, N. Magnenat-Thalmann, S. Biasotti, M. Mortara, B. Falcidieno, P. Min and R. Veltkamp "Animatable Human Body Model Reconstruction from 3D Scan Data using Templates", Proc. CapTech Workshop on Modelling and Motion Capture Techniques for Virtual Environments, Zermatt, Switzerland, December 2004

[9]   P. Volino, N. Magnenat-Thalmann, "Animating Complex Hairstyles in Real-Time", VRST 2004, November 2004

[10]   N. Magnenat Thalmann, F. Dellas, C. Luible and P. Volino, "From Roman Garment to Haute-Couture with the Fashionizer Plateform", Virtual Systems and Multi Media, Japan, November 2004

[11]   F. Cordier, N. Magnenat-Thalmann "A Data-driven Approach for Real-Time Clothes Simulation", 12th Pacific Conference on Computer Graphics and Applications, IEEE Computer Society, pp. 257-266, October 6-8, 2004, Seoul Korea., October 2004

[12]   Gilles, R. Perrin, N. Magnenat-Thalmann, J-P. Vallée. "Bone motion analysis from dynamic MRI: acquisition and tracking", International conference on medical image computing and computer assisted intervention (MICCAI) 2004, St Malo, France, September 2004

[13]   N. Magnenat Thalmann, H.Seo "Data-Driven Approaches to Digital Human Modelling", Proc. 2nd International Symposium on 3D Data Processing, Visualization, and Transmission, Thessalonica, Greece, IEEE Computer Society Press, September 2004

[14]   M.J. Kang, L. Yahia-Cherif, T. Molet, B. Gilles, L. Moccozet, N. Magnenat-Thalmann "Anatomy-based Optical Motion Capture for Integral Joint Motion Visualization and Analysis", 3rd International Workshop on Virtual Rehabilitation (IWVR) 2004, CUSO, September 2004

[15]   M.J. Kang, L. Yahia-Cherif, T. Molet, B. Gilles, L. Moccozet, N. Magnenat-Thalmann, "Anatomy-based Optical Motion Capture for Integral Joint Motion Visualization and Analysis", 3rd International Workshop on Virtual Rehabilitation (IWVR) 2004

[16]   N. Magnenat-Thalmann, F. Cordier, H. Seo, G. Papagiannakis "Modelling of Bodies and Clothes for Virtual Environments", CAVW04, July 2004

[17]   N. Magnenat Thalmann and H.Seo "Dynamic body transformation and matching from scanned data", , Proc. Shape Modelling International 2004, pp.3, Genova, Italy, IEEE Computer Society Press, June 2004

[18]   H. Kim, C. Joslin, T. Di Giacomo, S. Garchery, N. Magnenat-Thalmann "Adaptation Mechanism for Three Dimensional Content within the MPEG-21 Framework", Computer Graphics International 2004, June 2004

[19]   H. Kim, C. Joslin, T. Di Giacomo, S. Garchery, N. Magnenat-Thalmann "Multi-resolution Meshes for Multiple Target, Single Content Adaptation within the MPEG-21 Framework", IEEE ICME Conference, June 2004

[20]   N. Magnenat-Thalmann, G. Papagiannakis,A. Foni,M. Arevalo,N. Cadi-Yazli, "Simulating life in ancient sites using mixed reality technology", CEIG04, Seville, May 2004

[21]   L. Yahia-Cherif, T. Molet, N. Magnenat Thalmann. "Motion simulation of the hip joint using an optimized markers configuration", Proceedings of the 8th international symposium on the 3-D analysis of human movement, April 2004

[22]   G. Papagiannakis, S. Schertenleib, M. Ponder, M.Arévalo, N. Magnenat-Thalmann, D. Thalmann "Real-Time Virtual Humans in AR Sites", IEE Visual Media Production (CVMP), pp. 273-276, 15-16 March 2004, London, UK, March 2004

[23]   P. Gioia, A. Cotarmanac'h, K. Kamyab, P. Goulev, E. Mamdani, I. Wolf, A. Graffunder, G. Panis, A. Hutter, A. Difino, B. Negro, M. Kimiaei, C. Concolato, J. Dufourd, T. Di Giacomo, C. Joslin, N. Magnenat Thalmann. "ISIS: Intelligent Scalability for Interoperable Services", IEE 1st European Conference on Visual Media Production (CVMP), pp. 295-304, March 2004

[24]   Egges, S. Kshirsagar, N. Magnenat-Thalmann, "Generic Personality and Emotion Simulation for Conversational Agents", Computer Animation and Virtual Worlds, January 2004, pp. 1-13.

[25]   G. Papagiannakis, S. Schertenleib, M. Ponder, M. Arévalo, N. Magnenat-Thalmann, D. Thalmann, "Real-Time Virtual Humans in AR Sites", IEE Visual Media Production (CVMP), 15-16 March 2004, London, UK, March 2004, pp. 273-276.

[26]   Gilles, R. Perrin, J-P. Vallée, L. Moccozet, N. Magnenat-Thalmann, F. Terrier "A methodology for anatomical 3D modelling of patient's bones from MRI", Congrès annuel de la société suisse de radiologie (SSR) 2004, Interlaken., 2004

[27]   B. Gilles, R. Perrin, J-P. Vallée, L. Moccozet, N. Magnenat-Thalmann, F. Terrier "A methodology for anatomical 3D modelling of patient's bones from MRI", 12th scientific meeting and exhibition of the international society for magnetic resonance in medicine (ISMRM 2004), Kyoto, Japan, 2004

Books and book chapters

[28] N. Magnenat Thalmann and D. Thalmann, Handbook of Virtual Humans, Eds, Wiley & Sons, Ltd., publisher, August 2004, ISBN:0-470-02316-3.

[29] T. Di Giacomo, C. Joslin, S. Garchery, H. Kim, N. Magnenat-Thalmann. "Adaptation of Virtual Human Animation and Representation for MPEG", Elsevier Computer & Graphics, vol.28 no.4, pp. 65-74, August 2004

[30] T. Di Giacomo, N. Magnenat Thalmann, Fast Deformations with Multilayered Physics, in Game Programming Gems 4, Charles River Media, editor A. Kirmse, March 2004.

Research and technical reports

[31] Several technical reports for the following projects: LIFEPLUS, EPOCH, STAR, MUHCI, ISIS, WebDance, COME, ERATO, AIM@Shape, ENACTIVE, DANAE, HUMAINE.

INTERNATIONAL AND NATIONAL ADVISORY COMMITTEES

• Member of the third cycle in computer science committee, CUSO, Switzerland

• Member of the Board of the National Library, Bern

• Member of the Scientific Advisory Board of CSCS (Centro Svizzero di Calcolo Scientifico), Mano, Switzerland, 2004 - 2006

• Experts Jury Member of the Vienna Science and Technology Fund, Austria.

• Expert for European Union, Marie Curie Grants, Brussel, 2003 - 2004

CONFERENCE ORGANIZATION AS CHAIR OR CO-CHAIR

• CAPTECH 2004, Conference and program chair of the workshop, 3ème cycle romand d'informatique, Zermatt, 9-10 décembre 2004

• CGI 2004, Program co-chair of the Computer Graphics International, Heraklion, Greece, 2004

• CASA 2004, Conference and program co-chair of the conference (Computer Animation and Social Agents), University of Geneva, July 7-10, 2004

MEMBER OF CONFERENCE PROGRAM COMMITTEES

• VRST04, ACM Virtual Reality Software and Technology, Hong Kong, November 2004

• ISCIS04, International Symposium on Computer and Information Sciences, Antalya, Turkey, October 2004

• Eurographics 2004, Grenoble, France, September 2004

• VSMM 2004, 10th Conference on Vistual Systems and MultiMedia, Gifu, Japan,October 2004

• Laval Virtual 2004, Laval, France, May 2004

• EGVE04, Eurographics Symposium on Virtual Environments, Grenoble, France, June 2004

• ICAT 2004, Tokyo, Japan, 2004

• SMI04, Shape Modelling 2004, Genova, Italy

• SCA04, ACM SIGGRAPH Symposium on Computer Animation, Grenoble, France, July 2004

• CW2004, CyberWorlds 2004, Tokyo

• CGI04, Computer Graphics International 2004, Crete, July 2004

• FG04, 6th International Conference on Automatic Face and Gesture Recognition, Seoul, June 2004

• CGGM04, Workshop on Computer Graphics and Geometric Modeling, Krakow, Poland, June 2004

• AAMAS04, International Conference on Autonomous Agents and Multi-Agent Systems, New York, USA, June 2004

• 3IA2004, Limoges, France, May 2004

• FG2004, 6th International Conference on Automatic Face and Gesture Recognition, Seoul, Korea, 2004

• MMM04, 10th Conference on Multimedia Modelling, Brisbane, Australia, January 2004

INVITED TALKS

• Keynote speech at ICIG 2004, Modelling and animating anatomy-based humans, December 18, 2004, Hong-Kong

• Avenues of researches in the technologies of Information Systems, ST Microelectronics, Geneva, Dpt of economy, State of Geneva, Thursday 12, 2004

• Invited talk at City University in Hong-Kong, Virtual and augmented worlds: towards a new way of looking at everything, December 17, 2004

• Keynote speech at Cyberworld 2004, Tokyo, The modelling of bodies and clothes for virtual environments, November 19, 2004

• Keynote speech at VSMM'2004, Ogaki City, From Roman Garments to Haute Couture Collection with the Fashionizer Platform, November 17, 2004

• Invited Presentation at Kao Corporation, Japan, State of the Art in hair styling and animation, November 16, 2004

• Invited Presentation at the Genova Science Festival, Mixing Virtual and real scenes in ancient Pompeii, November 8, 2004

• Invited talk at IEEE-SMC 2004, The Hague, On-Line virtual manufacturing of garments, October 11, 2004

• Invited talk at 3DVT04, Tessalonike, Greece, Data driven approaches to digital Human modelling, September 8, 2004

• Invited talk on Simulating life in ancient sites using mixed reality technology. Spanish computer graphics conference, Sevilla, June 30

• Keynote speech on Behavioural speech and emotions, EUROGRAPHICS UK, Bournemouth, June 9, 2004

• Dynamic body transformation and matching from scanned data, SMI (SHAPE MODELING INTERACTIVE), SMI 2004 conference, Genova, June 6-9, 2004

• L'enseignement et la recherche des NTIC à l'Université de Genève, STmicroelectronics, Genève, February 12, 2004.

FUNDED RESEARCH PROJECTS :
PARTICIPATION TO EUROPEAN PROJECTS

HAPTEX

"HAPtic sensing of virtual TEXtiles"
(Prof. N. Magnenat-Thalmann, coordinator)
Website: haptex.miralab.unige.ch

Period: December 2004 - September 2007

ENACTIVE

"Enactive Interfaces"
Website: www.enactivenetwork.org

Period: January 2004 - January 2008

EPOCH

"European research network on excellence in Processing Open Cultural Heritage"
Website: www.epoch-net.org

Period: March 2004 - February 2008

DANAE

"Dynamic and distributed Adaptation of scalable multimedia coNtent in a context-Aware Environment"
Website: danae.rd.francetelecom.com/

Period: January 2004 - July 2006

HUMAINE,

"Humaine-Machine Interaction Network on Emotion"
Website: emotion-research.net

Period: January 2004 - January 2008

AIM@SHAPE

"Advanced and Innovative Models And Tools for the development of Semantic-based systems for Handling, Acquiring, and Processing knowledge Embedded in multidimensional digital objects"
Website: www.aimatshape.net

Period: January 2004 - January 2006

ERATO

"Identification, Evaluation and Revival of the Acoustical Heritage of Ancient Theatres and Odea"
Website: www.at.oersted.dtu.dk/~erato/

Period: September 2002 - January 2006

INTUITION

"Network of Excellence on Virtual Reality anb Virtual Environments Applications for Future Workspaces"
Website: www.intuition-eunetwork.net

Period: September 2004 - August 2008

WebDANCE

"Dance for all using advanced e-learning tools"
Website: www.aegean.gr/culturaltec/webdance/

Period: October 2002 - September 2004

ISIS

"Intelligent Scalability for Interoperable Services"
Website: isis.rd.francetelecom.com

Period: July 2002 - February 2004

LIFEPLUS

"Innovative Revival of Life in Ancient Frescos and Creation of Immersive Narrative Spaces, Featuring Real Scenes with Behaviored Virtual Fauna and Flora"
Website: www.miralab.unige.ch/subpages/lifeplus

Period: April 2002 - August 2004

MELIES

"Modelling Equipment for Interactive Electronic Streaming"
Website: www.xdprod.com/~melies

Period: October 2001 - March 2004

STAR

"Services And Training Through Augmented Reality"
Website: www.realviz.com/STAR/

Period: July 2001 - June 2004

MUHCI

" Multi-modal Human-Computer Interaction European Commission "
Website: www.muhci.org

Period: May 2000 - August 2004

e-MERIT

"An Integrted E-Collaborative Environment For Product And Process Modelling Using 3d Models And Avatars"
Website:

Period: January 03 - October 2004

FUNDED RESEARCH PROJECTS :

PARTICIPATION TO NATIONAL PROJECTS

CO-ME, NCCR project
"The Computer Aided and Image Guided Medical Interventions"
Website: www.co-me.org

Period: January 2001 - June 2005

"Swiss National Research Foundation"
Website: www.miralab.unige.ch

Period: October 2002 - September 2004

TECHNOLOGY TRANSFER

- In 2004, MIRALab has contributed to the creation of MIRADREAMS s.a., a spinoff offering 3D services for the clothing industry.

OTHERS

HONOURS AND SCIENTIFIC AWARDS

- Professor Nadia Magnenat-Thalmann selected as a pioneer in Information Technology at the Heinz Nixdorf Museum's Electronic Wall of Fame in Germany (www.hnf.de), 2004

PUBLIC EXHIBITION AND PERFORMANCE

- "Dreams of a model", 7 minutes, Musée d'art et d'histoire, Geneva, October 2 - March 7, 2004.

COURSES AND TUTORIALS

- Tutorial organized and given at SIGGRAPH 2004, in Los Angeles, photorealistic hair modelling, animation and rendering, August 8, 2004

- Tutorial organized and given at EUROGRAPHICS 2004, in Grenoble, France, Simulation of clothes for Real-time applications, August 30, 2004

- Tutorial given at EUROGRAPHICS 2004, in Grenoble, France, Automatic generation of population, August 31, 2004

- Tutorial given at EUROGRAPHICS 2004, in Grenoble, France, Advanced virtual medecine, August 31, 2004

PRESS CONFERENCE

- Presentation Project Lifeplus, University of Geneva, September 28, 2004.

REFEREEING

- Jury of Ph.D. thesis for New Zealand, France, Sweden, and Switzerland.

- European Union, Esprit Projects, Brussels.

- Research Grants Council of Singapore.

- Natural Sciences and Engineering Research Council of Canada.

- National Science Foundation U.S.A.

- Swiss National Research Foundation.

- Austrian Research Foundation.

- ACM SIGGRAPH, IEEE Transactions on Visualization and Computer Graphics, IEEE Computer Graphics and Applications, IEEE Computer, Communications of ACM, The Visual Computer, Computer Graphics Forum, Computer Vision, Graphics and Image Processing, Presence, International Journal of Human-Computer Studies, Computers and Graphics.

EDITORIAL RESPONSABILITIES

- Member of the Advisor Board, International Journal of Image and Graphics, World Scientific, since January 2001

- Since January 2000, Editor-in-chief of the Journal "The Visual Computer" published by Springer-Verlag, Germany,

- Editor, Computational Geometry Journal, North Holland, since 1995.

- Member of Editorial Board, Journal of Universal Computer Science, Electronic Journal, since August 1994.

- Member of Editorial Board, Journal of Computer Graphics, Russia, since 1993.

- Since 1990, Co-founder and Co-editor-in-chief, "Journal of Visualization and Computer Animation", John Wiley and Sons.

- Since 1987, Associate Editor-in-chief, "The Visual Computer", Springer-Verlag, Heidelberg.

OSG Object

2004 Activity Report

DOMAIN ACTIVITIES

The OSG's core research has traditionally been object-based systems. Over the last few years the direction of research has shifted towards the study of issues related with autonomous and mobile systems (applications of Object-Oriented systems) and Free and Open Source Software (F/OSS) processes for software production and distribution.

More specifically the current research areas of the group are:

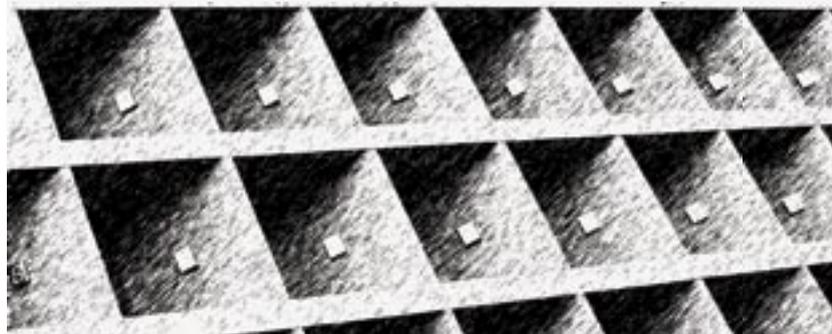*Mobile applications:* location based services and applications mobile health applications and ambient intelligence

Free and Open Source Software: define a scalable and secure architecture for the packaging, testing and distribution of F/OSS.

Security and resource management: formalization and implementation of a model based on the human notion of trust, with concepts such as "recommendations" and uncertainty.

Self-assembly of software, self-organising, and self-adapting systems, realised using specification carrying code and reputation systems. Design of service architecture based on interactions occurring through semantic service description, without relying on the notion of APIs.

Digital Rights Management and Digital Policy Management: This research field covers the issue of persistent information protection. By persistently associating usage rules to content, it becomes possible to control the use of the content even outside the traditional perimeter based security.

Web: http://cui.unige.ch/OSG

TEAM

Director
Dimitri Konstantas
Full professor

Members
Dr. Ciarán Bryce, Scientific manager
Dr. Jean-Henry Morin, Senior researcher
Dr. Giovana Di Marzo Serugendo, Senior researcher

PhD Students
Michel Pawlak
Michel Deriaz
Katarzyna Wac
Manuel Oriol
Chrislain Razafimahefa

PhD Thesis

- Manuel Oriol, An Approach to the Dynamic Evolution of Software Systems (these 556), April 2004

- Chrislain Razafimahefa, A programming Model and Execution Environment for Autonomous Systems (these 575), July 2004

List of publications

Refereed papers in international journals

[1] Aart Van Halteren, Richard Bults, Katarzyna Wac, Dimitri Konstantas, Ing Widya, Nicolai Dokovsky, George Koprinkov, Val Jones, Rainer Herzog, "Mobile Patient Monitoring: the MobiHealth System", in Journal on Information Technology in Healthcare, (vol.2 2004).

[2] M. Oriol, G. Di Marzo Serugendo, "A Disconnected Service Architecture for Unanticipated Run-time Evolution of Code", IEE Proceedings-Software, Special Issue on Unanticipated Software Evolution, Susan Eisenbach (Ed), pp. 95-107, 2004.

Full refereed papers in Conference Proceedings

[3] Dimitri Konstantas, Aart Van Halteren, Richard Bults, Katarzyna Wac, Ing Widya, Nicolai Dokovsky, George Koprinkov, Val Jones, Rainer Herzog, "Mobile Patient Monitoring: the MobiHealth System", proceedings of the International Congress on Medical and Care Compunetics, ICMCC 2004, NCC, The Hague, June2-4, 2004 (also published in the Journal on Information Technology in Healthcare in 2004).

[4] Richard Bults, Katarzyna Wac, Aart Van Halteren, Dimitri Konstantas, Val Jones, Ing Widya," Body Area Networks for Ambulant Patient Monitoring Over Next Generation Public Wireless Networks", proceedings of the 13thIST Mobile & Wireless Communications Summit 2004, Lyon, France, 27-30 June 2004.

[5] Katarzyna Wac, Richard Bults, Dimitri Konstantas, Aart Van Halteren, Val Jones, Ing Widya, Rainer Herzog, "Mobile Health Care over 3G Networks: The MobiHealth Pilot System and Service", proceedings of the Gobal Mobile Congress, GMC'04, Oct. 11-13, 2004, Shanghai, China.

[6] Jarle Hulaas, Walter Binder, Giovanna Di Marzo Serugendo: "Enhancing Java Grid Computing Security with Resource Control", In the International Conference on Grid Services Engineering and Management (GSEM'04), September 2004.

[7] G. Di Marzo Serugendo, N.Foukia, S. Hassas, A.Karageorgos, S. Kouadri Mostéfaoui, O. F. Rana, M. Ulieru, P. Valckenaers, C.Van Aart, "Self-Organising Applications: Paradigms and Applications". Proceedings of the Engineering Self-Organising Applications Workshop (ESOA'03), G. Di Marzo Serugendo, A. Karageorgos, O. F. Rana, F. Zambonelli (Eds), LNCS 2977, Springer-Verlag, 2004.

[8] Seigneur (J.), Dimmock (N.), Bryce (C.), Jensen (C.), Combatting SPAM with Trustworthy Email Addresses, in 3rd ACM Conference on Privacy, Security and Trust, New Brunswick, Canada, August 2004.

Books and book chapters

[9] Van Halteren A., Konstantas D., Bults R. Wac K., Dokovsky N. Koprinkov G., Jones V., Widya I.: MobiHealth: Ambulant Patient Monitoring Over Next Generation Public Wireless Networks In: G. Demiris (Ed.), e-health: Current Status and Future Trends, IOS Press, Amsterdam ISBN: 1 58603 442 1

[10] Van Halteren, R.G.A. Bults, I.A. Widya, V.M. Jones, D.M. Konstantas, "Mobihealth-Wireless body area networks for healthcare", in "Wearable eHealth Systems for Personalised Health Management", A. Lymberis and D. de Rossi, Editors, IOS Press, Amsterdam, 2004, 360 pp., ISBN: 1 58603 449 9

[11] "Engineering Self-Organising Systems: Nature-Inspired Approaches to Software Engineering". G. Di Marzo Serugendo, A. Karageorgos, O. F. Rana, F. Zambonelli (Eds), LNAI 2977, Springer-Verlag, 2004.

[12] Bryce (C.), Czajkpwski (G.), Resource Management, The 10th ECOOP Workshop on Mobile Object Systems (Paradigm Alive?), in ECOOP 2004 Workshop Reader, Editor Jacques Malenfant, LNCS, December 2004.

Research and technical reports

[13] G. Di Marzo Serugendo, Marie-Pierre Gleizes, Anthony Karageorgos "AgentLink First Technical Forum Group Self-Organisation in Multi-Agent Systems", AgentLink Newsletter, Issue 16, ISSN 1465-3842, December 2004.

[14] Jordan (M.), Dayn\'es (L.), Czajkowski (G.), Jarzab (M.), Bryce (C.), Applying the Multi-tasking Virtual Machine to a J2EE Server, March 2004, Sun Microsystem Laboratories.

[15] Semantic Service Oriented Architecture Michel Deriaz, Giovanna Di Marzo Serugendo, 2004, http://cui.unige.ch/~deriazm/publications/SpecServices20041110.pdf

[16] Trust in Ambient Intelligence Systems Michel Deriaz, 2004, http://cui.unige.ch/~deriazm/publications/Trust20040519.pdf

[17] J.-H. Morin, M. Pawlak and M. Oriol, "Enabling Technologies for the Interoperable Enterprise", in Proceedings of Workshop on Interoperability of Enterprise Systems, INTEREST 2004, part of ECOOP 2004, Oslo, Norway, June 14-18, 2004.

International and national advisory committees

- Dimitri Konstantas , since 2003 : Expert evaluator for the Canadian National research foundation

- Dimitri Konstantas , 2004 : Member of the external experts committee for the creation of the University of Luxembourg

- Dimitri Konstantas, 2004 : Expert evaluator for OFES

- Giovana Di Marzo Serugendo, January to December 2004 : Expert for projects funded by the Luxembourg government

Conference organization as chair or co-chair

- Ciaran Bryce, PC Chair, MOS Workshops at European Conference on Object-Oriented Programming, Oslo, 2004.

- Giovana Di Marzo Serugendo, PC Co-chair, July 2004, Engineering Self-Organising Applications Workshop (ESOA'04)

- Jean-Henry Morin, Co-chair of the Peer-to-Peer Infrastructures and Applications minitrack in the Software Technology Track of the Hawaii International Conference on System Sciences, (HICSS-38)

Member of conference program committees

- Ciran Bryce, IEEE Conference on Distributed Computing Systems

- Ciran Bryce, ACM Symposium on Applied Computing

- Giovana Di Marzo Serugendo, AISTA'04, International Conference on Advances in Intelligent Systems Theory and Applications. Luxembourg, November, 2004

- Giovana Di Marzo Serugendo, PNC04, First International Workshop on Coordination and Petri Nets, Bologna, Italy, June 2004

- Giovana Di Marzo Serugendo, AAMAS'04, Autonomous Agents and Multi-Agent Systems Conference , New-York, July 2004

- Giovana Di Marzo Serugendo, IWUC'04, International Workshop on Ubiquitous Computing, Porto, Portugal, April 2004

- Giovana Di Marzo Serugendo, FIDJI'04, scientiFic Engineering of Distributed Java Applications, Luxembourg, November 2004

FUNDED RESEARCH PROJECTS :
PARTICIPATION TO EUROPEAN PROJECTS

Interop NoE

Period: November 2003 - October 2006

EDOS

Period: November 2004 - April 2007

SECURE

Period: January 2002 - December 2004

FUNDED RESEARCH PROJECTS :
PARTICIPATION TO NATIONAL PROJECTS

Engineering Self-Organising Applications

Period: October 2002 - September 2004

Social Semantical Infrastructure Suporing Ambient Intelligence

Period: October 2004 - September 2005

OTHERS

Giovana Di Marzo Serugendo

- Editor-in-Chief, ACM Transactions on Autonomous Adaptive Systems (2004-2007)
- Nomination for Descartes Prize 2003

Giovana Di Marzo Serugendo - Referee :

- Third Workshop on Modeling of Objects, Components and Agents (MOCA'04)
- International Conference on Complex Systems (ICCS'20004)
- International Conference on Dependable Systems and Networks (DSN'04)
- European Conference on Artificial Intelligence (ECAI'04)
- AgentLink III - University of Geneva Contact Point

Giovana Di Marzo Serugendo - Working Group :

- AgentLink III Technical Forum on Self-Organisation in MAS - Co-chair (2004-2005).

Jean-Henry Morin

- Third International Workshop on Agents and Peer-to-Peer Computing (AP2PC 2004), New York City, USA, July 19-20, 2004.
- Second International Workshop On Databases, Information Systems and Peer-to-Peer Computing (DBISP2P), Collocated with VLDB 2004, Toronto, Canada, August 30 - September 3, 2004.

Michel Deriaz

- Development and distribution of a tool handling regular expressions. Available in many download sites (like http://www.telecharger.com) or programmers sites (like http://java.developpez.com/). - Main page: http://cui.unige.ch/~deriazm/Softs/RegexSR/

Manuel Oriol

- Young Researcher Grant Award from FNRS (one year)

Chrislain Razafimahefa

- Young Researcher Grant Award from FNRS (one year)

SPC Scientific

2004 Activity Report

DOMAIN ACTIVITIES

One main research activity concerns the study of complex systems, in particular the development of new numerical methods to model and simulate phenomena in natural sciences, economics, social systems and bio-medical applications. Cellular automata, lattice Boltzmann and multi-agents techniques are central tool to address these questions. Parallel programs and algorithms are developed to implement the simulation on large PC clusters to discover, explain or reproduce new phenomena.

Another domain of activity is bioinformatics, in collaboration with Swiss Institute of Bioinformatics. New calssification methods and algorithmiques techniques are developed to analyse the coding in protein sequences and to build large phylogenetic trees.

http://cui.unige.ch/spc/

TEAM

Director
Bastien Chopard
Associate Prof.

Members
Dr. Rafik Ouared

PhD Students
Davide Alemani
Philippe Combes
Jean-Luc Falcone
Jonas Latt
Hung Nguyen
Bernhart Sonderegge

Fokko Beekof

PHD THESIS

" Christian Condevaux-Lanloy, Extension de l'interface entre langage de modélisation et codes d'optimisation: application à la programmation stochastique multi-étape linéaire et non-linéaire (In co-direction with Prof J.-P. Vial), 2004

LIST OF PUBLICATIONS

Refereed papers in international journals

[1] Miki Hirabayashi, Makoto Ohta, Daniel A. Rufenacht and Bastien Chopard, A Lattice Boltzmann Study of Blood Flow in Stented Aneurysms, Future Generation Computer Systems (FGCS), vol. 20, p. 925-934, 2004.

[2] Hung Phi Nguyen, Bastien Chopard and Serge Stoll, Hydrodynamic properties of fractal aggregates in 2D using Lattice Boltzmann Simulations, Future Generation Computer Systems (FGCS), vol. 20, 981-991, 2004.

[3] Jonas Latt and B. Chopard, An implicitly parallel object-oriented matrix library and its application to medical physics Advances in Computation: Theory and Practice, vol.15. 2004.

[4] J. Latt and B. Chopard, Vladymir -- a c++ matrix library for data-parallel applications, Future Generation Computer Systems, (2004), 1023-1039.

[5] M. A. da. R. Ferreira, R.L. Cancian, A.H. da F. Flein, F.M.P. Tena, and B. Chopard. Study of wind movement through cellular automata and lattice Boltzmann Approach. Journ. Costal Research, SI 39, 2004

[6] P. Albuquerque, D. Alemani, B. Chopard and P. Leone, A multigrid lattice Boltzmann finite difference scheme for the diffusion equation. submitted to the International Journal For Multiscale Computational Engineering, 2004.

Full refereed papers in Conference Proceedings

[7] P. Albuquerque, D. Alemani, B. Chopard, P. Leone, Coupling a Lattice Boltzmann and a Finite Difference Scheme. Computational Science, ICCS-04, Kracow, June 6-9, 2004. LCNS 3039, Bubak, M.; Albada, G.D.v.; Sloot, P.M.A.; Dongarra, J. (Eds.) Springer Verlag, Berlin.

[8] L. Cappietti and B. Chopard. Lattice Boltzmann numerical simulation of Stokes boundary layer and wavy wall. XXIX Convegno di Idraulica e Costruzioni Idrauliche, Trento, Sept. 2004.

[9] B. Chopard, M Tomassini, Randomized Computation with Cellular Automata, Cellular Automata: 6th International Conference on Cellular Automata for Research and Industry, ACRI 2004, Amsterdam, The Netherlands, October 25-28, 2004. Proceedings, p. 71.

[10] J. Latt, G. Courbebaisse, B. Chopard and J.-L. Falcone, Lattice Boltzmann Modeling of Injection Moulding Process. Cellular Automata: 6th International Conference on Cellular Automata for Research and Industry, ACRI 2004, Amsterdam, The Netherlands, October 25-28, 2004. Proceedings, p. 345.

INTERNATIONAL AND NATIONAL ADVISORY COMMITTEES

• Bastien Chopard, PhD committee of M Rohde, TU-Delft NL, Dec 2004

• Bastien Chopard, PhD committee of N Ammor, Univ. Rabbat, Maroc, Dec 2004

• Bastien Chopard, PhD committee of T. Nguyen, EPFL, Switzerland. August 2004

• Bastien Chopard, PhD committee of M Oriol, Univ. Geneva Switzerland, April 2004

• Bastien Chopard, PhD committee of Niloy Ganguly, Bengal Engineering college, India, March 2004

CONFERENCE ORGANIZATION AS CHAIR OR CO-CHAIR

• Bastien Chopard, Co-chair, Workshop on multiscale and multiphysics, ICCS 04, Kracow, June 04.

• Bastien Chopard, Co-chair, Int. Conf. On cellulat automata for research and Industry, ACRI 2004, Amsterdam.

MEMBER OF CONFERENCE PROGRAM COMMITTEES

• DSFD 04 (Discrete Simulation of Fluid Dynamics), Boston, August 04

• ICCS 04 (Int. Conf. Computational Science), Kracow, June 04

FUNDED RESEARCH PROJECTS :
PARTICIPATION TO NATIONAL PROJECTS

Anataxis

"Recontruction of the tree of life with new parallel algorithm"

Period: April 2004 - October 2006

Decoding Signal Sequences

Period: October 2004 - September 2006

Lattice Boltzmann Methods for fluid flow

Period: April 2003 - March 2005

Hydrodynamic Properties of fractal aggregates

Period: 2002 - 2005

Modeling reaction-diffusion processes in complex environmental problems

Period: 2004 - 2007

SystemC distributed simulation for 3rd and 4th generation of phone platforms, CTI

Period: October 2003 - September 2006

Simulation of Bloodflow in stented aneurysms. Grant from fondation Boninchi

Period: June 2004 - June 2005

Decoding the Signal Sequence, a new Bioinformatic Approach

Period: October 2002 - September 2004

SMV Software

DOMAIN ACTIVITIES

Developing complex and reliable software systems requires rigorous methods for modelling, designing and verifying them. The SMV lab is involved in designing dedicated formalisms that are semantically well described in order to make analysis of system properties possible, to automatically produce code and to select pertinent test cases. A coherent set of tools has been developed in order to apply our methods to software-intensive systems.

We are currently studying :

1. development of techniques for distributed object-oriented and reconfigurable system modelling

2. test selection techniques

3. software prototyping and GUI generation

4. model engineering (MDA, UML, model transformation)

Web: http://smv.unige.ch/

TEAM

Director
Didier Buchs
Associate professor

Members
Dr. David Hurzeler
Dr. Adel Besrour
Dr. Shane Sendall

PhD Students
Ang Chen
Stanislav Chachkov
Levi Lúcio
Luis Pedro
Matteo Risoldi

PhD Thesis

- Stanislav Chachkov, Generation of Object-Oriented programs from CO-OPN Specifications (Ph.D. Thesis, Ecole Polytechnique Fédérale de Lausanne, Département d'informatique, 1015, Lausanne, Suisse), January 2004

- David Hurzeler, Flexible subtyping relations for component-oriented formalisms and their verification (Ecole Polytechnique Fédérale de Lausanne, Département d'informatique, 1015, Lausanne, Suisse), November 2004

- Adel Besrour, MORM : Modeling risk at the workplace (Ecole Polytechnique Fédérale de Lausanne, Département d'informatique, 1015, Lausanne, Suisse), November 2004

List of publications

Refereed papers in international journals

[1] David Vernez, Didier R. Buchs, Guillaume E. Pierrehumbert, and Adel Besrour, MORM-A Petri Net Based Model for Assessing OH&S Risks in Industrial Processes: Modeling Qualitative Aspects, Risk Analysis, Volume, 24 Issue 6 Page 1719-1735 - December 2004

[2] Stanislav Chachkov and Didier Buchs, Interfacing Software Libraries from Non-deterministic Prototypes, Design and Automation for Embeded System Journal, Volume 8, Issue 4, pp. 327-343

Full refereed papers in Conference Proceedings

[3] "A Methodology and a Framework for Model-Based Testing ", Levi Lúcio, Luís Pedro and Didier Buchs. Proceedings of RISE 2004, University of Luxembourg, Luxembourg, pp.52-63. LNCS 3475 .

[4] Buchs Didier, Buffo Mathieu: A Formal Component-Oriented Design Language for Building Distributed System, Workshop on Petri Nets and Coordination, Bologna, june 2004, pp 1-20

[5] Besrour Adel and Buchs Didier, Modular Modelling and Construction of Finite Simulation in MORM, International Conference on Modelling and Simulation (MS 2004), Marina del Rey, CA-USA

[6] Adel Besrour, "Object-Oriented Methodology in Modelling and Simulation : Industrial MORM Framework", Modelling Computation and Optimization in Information Systems and Managemement Sciences "MCO'04", pp 273-280, Hermes Science Publishing, July 2004, Metz,France

[7] Besrour Adel and David Hurzeler and Didier Buchs, Concurrent Object Oriented Approach in MORM simulation, international Conference on Software Engineering (SE 2004), pp 90-94, Innsbruck.

[8] Didier Buchs, Levi Lúcio, and Luis Pedro : UML and Petri Nets for test case generation, Tutorial on UML and Coloured Petri Nets at CPN'04, Aahrus University.

Books and book chapters

[9] Levi Lucio, Marko Samer, Technology of Test Case Generation, in Model based Testing of Reactive Software, Editor : Manfred Broy, Bengt Jonsson, Joost-Pieter Katoen, Martin Leucker, Alexander Pretschner, LNCS 3472.

International and national advisory committees

- D. Buchs: PhD Committee : Stanislav Chachkov, Generation of Object-Oriented programs from CO-OPN Specifications, Ph.D. Thesis, Ecole Polytechnique Fédérale de Lausanne, Département d'informatique, CH-1015, Lausanne, Suisse, january 2004.

- D. Buchs: PhD Committee : Nicolas Rapin: Validation de spécifications à base d'automates par des techniques de dépliage et d'exécution symbolique, Rapporteur, Université d'Evry, 1 juillet 2004, France

- D. Buchs: PhD Committee : Chrislain Razafimahefa A programming Model and execution environment for autonomous systems, University of Geneva, july 2004.

- D. Buchs: PhD Committee : David Hurzeler, Flexible subtyping relations for component-oriented formalisms and their verification, Ecole Polytechnique Fédérale de Lausanne, Département d'informatique, CH-1015, Lausanne, Suisse, november 2004.

- D. Buchs: PhD Committee : Adel Besrour, An Object-Oriented Approach for Dynamic System Modelling and Simulation , Ecole Polytechnique Fédérale de Lausanne, Département d'informatique, CH-1015, Lausanne, Suisse, november 2004.

- D. Buchs: PhD Committee : Cécile BUI THANH, Modèles Orientés-Objet pour la Vérification de Systèmes Concurrents , Université de Créteil, december 2004,

- D. Buchs: PhD Committee : Nicolas Vacelet, Evaluation de notations formelles de spécifications par systèmes de contraintes Université de Franche-comté, decembre 2004, Besançon.

- D. Buchs: Steering committee, Conf. Rapid System Prototyping

Conference organization as chair or co-chair

- D. Buchs, Organizer of Conf. Rapid System Prototyping, june 2004, Geneva, 2004.

Member of conference program committees

- D. Buchs: ICATPN, Program committee of International Conference on Application and theory of Petri Nets, Bologna, june 2004

- D. Buchs: AFADL, Program committee of AFADL, Besançon, june 2004

- D. Buchs: RSP, Program Committee Conf. on Rapid System Prototyping, Geneva June 2004.

- D. Buchs: MOCA, Program committee Workshop Modelling of Objects, Components, and Agents (MOCA'04), Aahrus,october 2004

- D. Buchs: RISE 2004, Program committee, Luxembourg, October 2004

FUNDED RESEARCH PROJECTS :
PARTICIPATION TO EUROPEAN PROJECTS

Interreg TestUML

Period: November 2002 - October 2004

CORRECT

"rigorous stepwise development of Complex Fault tOlerant DistRibuted systems: from ARchitEctural DesCription to Java ImplemenTation"

Period: 2004 - 2006

FUNDED RESEARCH PROJECTS :
PARTICIPATION TO NATIONAL PROJECTS

Formal Methods for Embedded Systems

ISIS - RA,

Integrated System Implementation and Specification for Reliable distributed Applications

Period: November 2004 - October 2006

MORM

Man-Machine Occupational Risk Modeling FNRS

Period: January - December 2004

VeDiss Project

funded by Haslerstiftung, DICS initiative
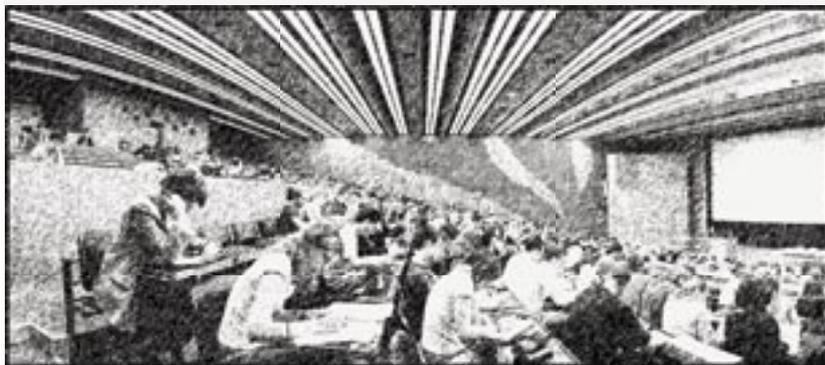
Period: August 2003 - July 2006

TCS Theoretical

DOMAIN ACTIVITIES

The TCS-Sensor Lab (Theoretical Computer Science and Sensor Networks Lab) main research activities are in large measure concerned with the representation, transformation and communication properties of information systems such as ad-hoc, sensor networks and embedded systems. A certain body of knowledge emphasizing the interweaving themes of complexity and algorithms represent the research axis of theoretical computer science. Under complexity one includes questions which tasks can or cannot be performed by information systems of different aspects restricted in several resources such as running time, memory amount, energy dissipation or communication transmission. Under algorithm one includes questions regarding how efficient a task can be performed in terms of such resources. These questions are often addressed by developing models of relevant parts of information systems such as processors, their interconnections, their rules of operation, the means of communication, etc. and by the study of properties of such models.

Web: http://cui.unige.ch/tcs/

TEAM

Director
Jose Rolim
Full professor

Members:
Claude Tadonki
Goulnara Atjantseva
Pierre Leone
Gregory Lafitte
Michael Weiss

PhD Students:
Olivier Powell
Alexi Popov
Matthieu Bouget
Philippe Moser

PhD Thesis

" Philippe Moser, Derandomization and Quantitative Complexity, 2004

List of publications

Refereed papers in international journals

[1] Olivier Powell, A note on measuring in P, Theoretical computer Science, Volume 320, Issue 2-3, 14 June 2004, Pages 229-246, Elsevier

[2] R.P.K. Chan, P. Leone, A. Tsai, Order Conditions and Symmetry for Two-Step Hybrid Methods, International Journal of Computer Mathematics, Vol. 81, No. 12, December 2004, pp. 1519-1536

Full refereed papers in Conference Proceedings

[3] Pierre Leone, José D. P. Rolim: Towards a Dynamical Model for Wireless Sensor Networks. Algosensors 2004, Icalp 2004 (LNCS/Springer) : 98-108

[4] Charilaos Efthymiou, Sotiris E. nikoletseas, Jose Rolim Energy Balanced Data Propagation in Wireless Sensor Networks. IPDPS 2004 - IEEE Computer Society Press

[5] Claude Tadonki and Jose Rolim , An analytical model for energy minimization, III Workshop on Efficient and Experimental Algorithms, WEA04 (LNCS/Springer), Angra dos Reis, Rio de Janeiro, Brazil, May 2004.

[6] Claude Tadonki and Jose Rolim, An integer programming heuristic for the dual power management problem in wireless sensor networks, 2nd International Workshop on Managing Ubiquitous Communications and Services, MUCS2004, Dublin, December 13, 2004.

[7] O. Briant, C. Lemaréchal,K. Monneris,N. Perrot,C. Tadonki,F. Vanderbeck,J.-P. Vial,C. Beltran,P. Meurdesoif, Comparison of various approaches for column generation, Eigth Aussois Workshop on Combinatorial Optimization, 5-9 january 2004.

[8] Claude Tadonki and Jean-Philippe Vial, Efficient algorithm for linear pattern separation, International Conference on Computational Science, ICCS04 (LNCS/Springer), Krakow, Poland, June 2004.

[9] R. Ndoundam, C. Tadonki, and M. Tchuente, Parallel chip firing game associated with n-cube orientation, International Conference on Computational Science, ICCS04 (LNCS/Springer), Krakow, Poland, June 2004.

[10] Cesar Beltran, Claude Tadonki, Jean-Philippe Vial, Semi-Lagrangian relaxation, Computational Management Science Conference and Workshop on Computational Econometrics and Statistics, Link, Neuchatel, Switzerland, April 2004.

[11] Claude Tadonki, Cesar Beltran and Jean-Philippe Vial , Portfolio management with integrality constraints, Computational Management Science Conference and Workshop on Computational Econometrics and Statistics, Link, Neuchatel, Switzerland, April 2004 .

[12] C. Beltran, C. Tadonki and J.-Ph. Vial, The p-median problem solved by semi-Lagrangian relaxation, First Mathematical Programming Society International Conference on Continuous Optimization (ICCOPT I), Troy, USA, August 2-4, 2004.

[13] Claude Tadonki , Universal Report: A Generic Reverse Engineering Tool , 12th IEEE International Workshop on Program Comprehension, IWPC 2004 (IEEE), University of Bari, Bari, Italy , June 2004 .

Books and book chapters

[14] Sotiris Nikoletseas, Jose Rolim, Algorithmic Aspects of Wireless Sensor Networks: First International Workshop, ALGOSENSORS 2004, Turku, Finland, July 16, 2004. Proceedings. Springer 2004, ISBN 3-540-22476-9

[15] K. Jansen, S. Khanna, D. Ron , J. Rolim, Approximation, Randomization, and Combinatorial Optimization, Algorithms and Techniques, 7th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems, APPROX 2004, and 8th International Workshop on Randomization and Computation, RANDOM 2004, Cambridge, MA, USA, August 22-24, 2004, Proceedings. Lecture Notes in Computer Science 3122 Springer 2004, ISBN 3-540-22894-2

Research and technical reports

[16] G. Lafitte and C. Papazian, Sensor Networks: a graph automata approach, Rapport de recherche, CUI, Université de Genève, May 2004.

[17] G. Lafitte and M. Weiss, Games and complexity, Rapport de recherche, CUI, Université de Genève, March 2004.

International and national advisory committees

• Jose Rolim, Steering Committee Member: IPDPS IEEE International Parallel & Distributed Processing Symposium

• Jose Rolim, Steering Committee Chair: Random ACM Workshop on Randomized Techniques in Computation, Harvard University

• Jose Rolim, Steering Committee Chair: Approx ACM International Workshop on Approximation Algorithms for Combinatorial Optimization Problems, Harvard University

• Jose Rolim, Steering Committee Chair: WEA International Workshop on Efficient and Experimental Algorithms

Conference organization as chair or co-chair

• Jose Rolim, General Chair Chair: Random ACM Workshop on Randomized Techniques in Computation, Harvard University

• Jose Rolim, General Chair: Approx ACM International Workshop on Approximation Algorithms for Combinatorial Optimization Problems, Harvard University

• Jose Rolim, General and Program Chair: Algosensors 2004 First International Workshop on Algorithmic Aspects of Wireless Sensor Networks

Member of conference program committee

• WMAN 2004:, Jose Rolim , 4th IEEE International Workshop on Algorithms for Wireless, Mobile and Sensor Networks, April 2004, New Mexico, USA

• HPSEC 2004, Jose Rolim, 6th International Workshop on High Performance Scientific and Engineering Computing, August 2004, Montreal

• MOBIWAC 2004, Jose Rolim, ACM International Workshop on Mobility Management and Wireless Access Protocols, September 2004, Philadelphia

Invited talks

• Gregory Lafitte, Assemblée Générale de l'Association Française d'Informatique Théorique, ENS Ulm, Paris, France, January 2004

• Gregory Lafitte, IFIP Cellular Automata Workshop, Lyon, France, November 2004

• Pierre Leone, Crescco Workshop - colocated with FOCS 2004, Dynamical models for wireless sensor networks, October 2004

FUNDED RESEARCH PROJECTS :
PARTICIPATION TO EUROPEAN PROJECTS

CRESCCO,

"Critical Resource Sharing for Cooperation in Complex Systems"

Period: January - December 2004

ARACNE

"Approximation and Randomization Algorithms in Communication Networks"

Period: January - May 2004

FUNDED RESEARCH PROJECTS :
PARTICIPATION TO NATIONAL PROJECTS

PAC

Power Aware Computing

Period: January - December 2004

CG,

Complexity and Games

Period: January - December 2004

ViLoLa

A Virtual Logic Laboratory, CVS

Period: January - December 2004

Hardness, Randomness and quantumness

Period: October 2002 - September 2004

OTHERS

• Gregory Lafitte, Prix de la meilleure thèse de doctorat française de l'EATCS (European Association for Theoretical Computer

Financial Report

Financial Resources DIP and Swiss confederation	BUDGET
CUI Operating costs	CHF 406'622
Library	CHF 85'000
Academic Staff - Informatic Department	CHF 2'532'636
Academic Staff - Information Systems Department	CHF 1'689'341
Academic Staff - Linguistic Department, Informatic Unit	CHF 495'977
Administrative and Technical Staff	CHF 638'566
TOTAL	**CHF 5'848'162**

External funding obtained by the professors	CREDITS
Informatic Department	
1 professor position + 1 assistant position	CHF 325'000
UE funded Projects	CHF 779'376
Swiss funded Projects	CHF 1'312'199
Information Systems Department	
UE funded Projects	CHF 1'649'035
Swiss funded Projects	CHF 1'399'340
Linguistic Department, Informatic Unit	
Swiss funded Projects	CHF 213'514
TOTAL	**CHF 5'678'464**