

RESEARCH AT THE
CENTRE OF EXCELLENCE
IN MANAGEMENT
AND INFORMATION
TECHNOLOGY

[CEMIT]

Research at the Centre of Excellence in Management and Information Technology (CEMIT)

1. Presentation

The Centre of Excellence in Management and Information technology (CEMIT) is devoted to the systematic study, conception and analysis of strategies, methodologies, processes and systems related to electronic management. As the centre covers both the information system sciences and competencies related to strategic change and process management, it applies a comprehensive approach to ICT management systems. The interdisciplinary work in the centre has an analytical and critical character, offering important and complementary insights to the predominantly constructivist approaches.

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2. Scientific Publications

2.1. Articles published in Scientific Journals

KOLP M.

- Jureta, M. Kolp and S. Faulkner *Multi-Agent Patterns For Deploying Online Auctions*. To appear in International Journal of Intelligent Information Technologies (IJIIT), Idea Group, end 2005
- L. Penserini, M. Kolp and L. Spalazzi. *Social Oriented Engineering of Intelligent Software* To appear in International Journal of Web Intelligence and Agent Systems (WIAS), IOS Press, end 2005
- M. Kolp, T. Tung Do, S. Faulkner and D.T. Nguyen. *Social-Centric Development of Multi-Agent Architectures*. To appear in Journal of Organizational Computing and Electronic Commerce, Erlbaum Associates Inc., end 2005.
- M. Kolp, P. Giorgini and J. Mylopoulos. *Multi-Agents Architectures as Organizational Structures*. To appear in Journal of Autonomous Agents and Multi-Agent, Kluwer Academic Publishing, 2006.
- M. Kolp, A. Coyette and S. Faulkner. *Specifying Agent Oriented E-Commerce Software as Organizational Structure*. In Journal of System Science and System Engineering, 13(4) pp. 450-468, 2005.

SAERENS M.

- Fouss F. & Saerens M. (2004), *Yet another method for combining experts opinions: A maximum entropy model*. Proceedings of the 5th International Workshop on Multiple Classifier Systems (MCS 2004); Lecture Notes in Computer Science, Vol. 3077, Springer-Verlag, pp 82-91.
- Saerens M., Fouss F., Yen L. & Dupont P. (2004), *The principal components analysis of a graph, and its relationships to spectral clustering*. Proceedings of the 15th European Conference on Machine Learning (ECML 2004), Lecture Notes in Artificial Intelligence, Vol. 3201, Springer-Verlag, pp. 371-383.

VANDERDONCKT J.

- Vanderdonckt, J., Beirekdar, A., *Automated Web Evaluation by Guideline Review*, Journal of Web Engineering, Vol. 4, No. 2, 2005, pp. 102-117.
- Bouillon, L., Vanderdonckt, J., Souchon, N., *Rétro-ingénierie du modèle de présentation pour les pages Web*, Revue d'Interaction Homme-Machine, Vol. 5, No. 2, 2005, pp. 31-58.
- Amouh, T., Gemo, M., Macq, B., Vanderdonckt, J., El Gariani, A.W., Reynaert, M., Stamatakis, L., Thys, F., *Versatile Clinical Information System Design for Emergency Departments*, IEEE Transactions on Information Technology in Biomedicine, Vol. 9, No. 2, June 2005, pp. 1-10.
- Trevisan, D., Vanderdonckt, J., Macq, B., *Conceptualising Mixed Spaces of Interaction for Designing Continuous Interaction*, Virtual Reality, Vol. 8, No. 2, 2005, pp. 83-95. Accessible at <http://www.springerlink.com/app/home/contribution.asp?wasp=c070e875da3f4a0287007b17795bcd6&referrer=parent&backto=searcharticlesresults,1,1;searcharticlesresults,1,1;>

2.2. Books

KOLP M.

- *Perspectives in Conceptual Modeling*, Lecture Notes in Computer Science, Vol. 3770, Springer, 2005, 476 p., ISBN: 3-540-29395-7, Germany, Akoka, J.; Mayr, H.C.; Liddle, S.W.; Song, I.-Y.; Bertolotto, M.; Comyn-Wattiau, I.; v.d. Heuvel, W.-J.; Kolp, M.; Trujillo, J.; Kop, C. (Eds.),

VANDERDONCKT J.

- Jacob, R., Limbourg, Q., Vanderdonck, J. (Eds.), *Computer-Aided Design of User Interfaces IV*, Proc. of 5th Int. Conf. of Computer-Aided Design of User Interfaces CADUI'2004 (Funchal, 13-16 January 2004), Information Systems Series, Kluwer Academics, Dordrecht, 2005. ISBN for the hardback is 1-4020-3145-9. ISBN for the e-book is 1-4020-3304-4.
- Vanderdonck, J., Law, E. L.-C., Hvannberg, E.T. (Eds.) (2005). Proceedings of International COST294 Workshop on User Interface Quality Models (UIQM'05) in conjunction with INTERACT'05, 12th -13th September 2005, Rome, Italy.

2.3. Book chapters

HOANG T.

- M. Kolp, T. Tung Do, S. Faulkner and T.T. Hang Hoang *Organizational Modeling Patterns*. In S. K. Chung (Ed.) *Advances in Software Engineering and Knowledge Engineering Vol. III*, World Scientific, 2005.
- M. Kolp, T. Tung Do, S. Faulkner and T.T. Hang Hoang *Introspecting Agent-Oriented Design Patterns*. In S. K. Chung (Ed.) *Advances in Software Engineering and Knowledge Engineering Vol. III*, World Scientific, 2005.
- M. Kolp, T. Tung Do, S. Faulkner and T.T. Hang Hoang. *Architectural Styles and Patterns for Multi-Agent Systems*. In L. Jain (Ed.) *Design of Intelligent Multi-Agent Systems, Human-Centredness, Architectures, Learning and Adaptation*, pp. 103 -133, October 2004.

KOLP M.

- M. Kolp, T. Tung Do, S. Faulkner and T.T. Hang Hoang. *Architectural Styles and Patterns for Multi-Agent Systems*. In L. Jain (Ed.) *Design of Intelligent Multi-Agent Systems — Human-Centredness, Architectures, Learning and Adaptation*, pp. 103 -133, October 2004.
- M. Kolp, T. Do, S. Faulkner. *A Social Driven Design of E-Business System*. In R. Choren, A. Garcia, C. Lucena and A. Romanovsky (Eds.) *Software Engineering for Multi-Agent Systems III: Research Issues and Practical Applications*, Springer, 2005.
- M. Kolp, T. Tung Do, S. Faulkner and T.T. Hang Hoang *Organizational Modeling Patterns*. In S. K. Chung (Ed.) *Advances in Software Engineering and Knowledge Engineering Vol. III*, World Scientific, 2005.

- P. Giorgini, M. Kolp, J. Mylopoulos and J. Castro. *Tropos: A Requirements-Driven Methodology for Agent-Oriented Software* In B. Henderson-Sellers and P. Giorgini (Eds) *Agent-Oriented Methodologies*, Idea Group, 2005
- M. Kolp, T. Tung Do, S. Faulkner and T.T. Hang Hoang *Introspecting Agent-Oriented Design Patterns*. In S. K. Chung (Ed.) *Advances in Software Engineering and Knowledge Engineering Vol. III*, World Scientific, 2005.

VANDERDONCKT J.

- Mariage, C., Vanderdonckt, J., Pribeanu, C., State of the Art of Web Usability Guidelines, Chapter 41, in Proctor, R.W., Vu, K.-Ph.L. (Eds.), *The Handbook of Human Factors in Web Design*, Lawrence Erlbaum Associates, Mahwah, 2005, pp. 688-700.
- Limbourg, Q., Vanderdonckt, J., UsiXML: A User Interface Description Language Supporting Multiple Levels of Independence, in Matera, M., Comai, S. (Eds.), *Engineering Advanced Web Applications*, Rinton Press, Paramus, 2004, pp. 325-338.

3. Conferences

3.1. Conferences with proceedings

FOUSS F.

- Fouss F., Pirotte A. & Saerens M. (2004), *A Novel Way of Computing Dissimilarities between Nodes of a Graph, with Application to Collaborative Filtering*. 15th European Conference on Machine Learning (ECML 2004); Proceedings of the Workshop on Statistical Approaches for Web Mining (SAWM), pp 26-37.
- Saerens M., Fouss F., Yen L. & Dupont P. (2004), *The principal components analysis of a graph, and its relationships to spectral clustering*. Proceedings of the 15th European Conference on Machine Learning (ECML 2004), Lecture Notes in Artificial Intelligence, Vol. 3201, Springer-Verlag, Berlin, 2004, pp 371-383.
- Yen L., Vanvyve D., Wouters F., Fouss F., Verleysen M. & Saerens M. (2005), *Clustering using a random-walk based distance measure*. Proceedings of the 13th Symposium on Artificial Neural Networks (ESANN 2005), pp 317-324

SAERENS M.

- Fouss F., Renders J.-M. & Saerens M. (2004), *Some relationships between Kleinberg's hubs and authorities, correspondence analysis and Markov chains*. Proceedings of the 7th International Conference on the Statistical Analysis of Textual Data (JADT), pp. 445-455.
- Fouss F., Pirotte A. & Saerens M. (2004), *A Novel Way of Computing Dissimilarities between Nodes of a Graph, with Application to Collaborative Filtering*. 15th European Conference on Machine Learning (ECML 2004); Proceedings of the Workshop on Statistical Approaches for Web Mining (SAWM), pp 26-37.
- Yen L., Vanvyve D., Wouters F., Fouss F., Verleysen M. & Saerens M. (2005), *Clustering using a random walk-based distance measure*. Proceedings of the 13th European Symposium on Artificial Neural Networks (ESANN2005), pp. 317-324.
- Fouss F., Faulkner S., Kolp M., Pirotte A. & Saerens M. (2005), *Web recommendation system based on a Markov-chain model*. Proceedings of the 7th International Conference on Enterprise Information Systems (ICEIS 2005), vol. 4, pp. 56-63.
- Fouss F., Pirotte A., Renders J.-M & Saerens M. (2005), *A novel way of computing similarities between nodes of a graph, with application to collaborative recommendation*. Proceedings of the 2005 IEEE/ACM International Joint Conference on Web Intelligence, pp. 550-556.
- Saerens M. & Fouss F. (2005), *HITS is principal components analysis*. Proceedings of the 2005 IEEE/ACM International Joint Conference on Web Intelligence, pp. 782-785.

VANDERDONCKT J.

- Demeure, A., Calvary, G., Sottet, J.-B., Ganneau, V., Vanderdonck, J., *A Reference Model for Distributed User Interfaces*, Proc. of 4th Int. Workshop on Task Models and Diagrams for user interface design TA-MODIA'2005 (Gdansk, 26-27 September 2005), ACM Press, New York, 2005, pp. 79-86.

- Chevalier, A., Mariage, C., Vanderdonckt, J., Fouquereau, N., *MetroWeb, un logiciel d'aide à la conception de sites web ergonomiques - Une étude auprès de concepteurs expérimentés*, Troisièmes Journées d'étude en Psychologie ergonomique EPIQUE'2005 (Toulouse, 26-28 September 2005), 2005.
- Torres, I., Pastor, O., Limbourg, Q., Vanderdonckt, J., *Una experiencia práctica de generación de inter-faces de usuario a partir de esquemas conceptuales*, Proc. of VI Congreso de Interacción Persona Ordenador (AIPO) CEDI'2005 (Granada, 13-16 September 2005), A.R. Puerta & M. Gea (eds.), Thomson Paraninfo, Madrid, 2005, 401-404.
- Law, E., Hvannberg, E., Cockton, G., Palanque, Ph., Scapin, D., Springett, M., Stry, Ch., and Vander-donckt, J., *Towards the Maturation of IT Usability Evaluation (MAUSE)*, Proc. of 10th IFIP TC 13 Int. Conf. on Human-Computer Interaction INTERACT'2005 (Rome, 12-16 September 2005), M.-F. Costabile, F. Paternò (eds.), Lecture Notes in Computer Science, Vol. 3585, Springer-Verlag, Berlin, 2005, pp. 1134-1137.
- Beirekdar, A., Keita, M., Noirhomme, M., Randolet, F., Vanderdonckt, J., Mariage, C., *Flexible Reporting for Automated Usability and Accessibility Evaluation of Web Sites*, Proc. of 10th IFIP TC 13 Int. Conf. on Human-Computer Interaction INTERACT'2005 (Rome, 12-16 September 2005), M.-F. Costabile, F. Paternò (eds.), Lecture Notes in Computer Science, Vol. 3585, Springer-Verlag, Berlin, 2005, pp. 281-294. http://dx.doi.org/10.1007/11555261_25
- Coyette, A., Vanderdonckt, J., *A Sketching Tool for Designing Anyuser, Anyplatform, Anywhere User In-terfaces*, Proc. of 10th IFIP TC 13 Int. Conf. on Human-Computer Interaction INTERACT'2005 (Rome, 12-16 September 2005), M.-F. Costabile, F. Paternò (eds.), Lecture Notes in Computer Science, Vol. 3585, Springer-Verlag, Berlin, 2005, pp. 550-564. http://dx.doi.org/10.1007/11555261_45
- Grolaux, D., Vanderdonckt, J., Van Roy, P., *Attach me, Detach me, Assemble me like You Work*, Proc. of 10th IFIP TC 13 Int. Conf. on Human-Computer Interaction INTERACT'2005 (Rome, 12-16 September 2005), M.-F. Costabile, F. Paternò (eds.), Lecture Notes in Computer Science, Vol. 3585, Springer-Verlag, Berlin, 2005, pp. 198-212. http://dx.doi.org/10.1007/11555261_19
- Vanderdonckt, J., Grolaux, D., Van Roy, P., Limbourg, Q., Macq, B., Michel, B., *A Design Space for Con-text-Sensitive User Interfaces*, Proc. of ISCA 14th Int. Conf. on Intelligent and Adaptive Systems and Soft-ware Engineering IASSE'2005 (Toronto, July 20-22, 2005), International Society for Computers and their Applications, Toronto, 2005, pp. 207-214.
- Montero, F., López-Jaquero, V., Vanderdonckt, J., Gonzalez, P., Lozano, M.D., Limbourg, Q., *Solving the Mapping Problem in User Interface Design by Seamless Integration in IdealXML*, Proc. of 12th Int. Workshop on Design, Specification, and Verification of Interactive Systems DSV-IS'2005 (July 13-15, 2005, Newcastle upon Tyne), M. Harrison (ed.), Lecture Notes in Computer Science, Springer-Verlag, Berlin, 2005, to appear.
- Ponsard, Ch., Balych, N., Massonet, P., Vanderdonckt, J., van Lamsweerde, A., *Goal-Oriented Design of Domain Control Panels*, Proc. of 12th Int. Workshop on Design, Specification, and Verification of Interactive Systems DSV-IS'2005 (July 13-15, 2005, Newcastle upon Tyne), M. Harrison (ed.), Lecture Notes in Computer Science, Springer-Verlag, Berlin, 2005, to appear.

- Coyette, A., Vanderdonckt, J., Faulkner, S., Kolp, M., *Generating Abstract User Interfaces from an Informal Design*, Proc. of 17th Int. Conf. on Software Engineering and Knowledge Engineering SEKE'2005 (Taipei, July 14-16, 2005), 2005.
- Winckler, M., Vanderdonckt, J., *Towards a User-Centered Design of Web Applications based on a Task Model*, Proc. of Vth Int. Workshop on Web Oriented Software Technologies IWWOST'2005 (Porto, June 13th, 2005), D. Schwabe, G. Rossi, L. Olsina, V. Pelechano (eds.), Technical University of Valencia, Valencia, 2005, pp. 36-43. Also in CEUR Workshop Proceedings, Vol.153. <http://sunsite.informatik.rwthachen.de/Publications/CEUR-WS/Vol-153/paper3.pdf>
- Vanderdonckt, J., *A MDA-Compliant Environment for Developing User Interfaces of Information Systems*, Proc. of 17th Conf. on Advanced Information Systems Engineering CAiSE'05 (Porto, 13-17 June 2005), O. Pastor & J. Falcão e Cunha (eds.), Lecture Notes in Computer Science, Vol. 3520, Springer-Verlag, Berlin, 2005, pp. 16-31. Conference keynote address. http://dx.doi.org/10.1007/11431855_2
- Molina, J.P., Vanderdonckt, J., Montero, F., Gonzalez, P., *Towards Virtualization of User Interfaces based on UsiXML*, Proc. of 10th ACM Int. Conf. on 3D Web Technology Web3D'2005 (Bangor, March 29-April 1, 2005), ACM Press, New York, 2005, pp. 169-178.
- Trevisan, D.G., Gemo, M., Vanderdonckt, J., Macq, B., *Focus-Based Design of Mixed Reality Systems*, Proc. of 3rd Int. Workshop on Task Models and Diagrams for user interface design TAMODIA'2004 (Prague, November 15-16, 2004), Ph. Palanque, P. Slavik, M. Winckler (eds.), ACM Press, New York, 2004, pp. 59-66.
- Coyette, A., Faulkner, S., Kolp, M., Limbourg, Q., Vanderdonckt, J., *SketchiXML: Towards a Multi-Agent Design Tool for Sketching User Interfaces Based on UsiXML*, Proc. of 3rd Int. Workshop on Task Models and Diagrams for user interface design TAMODIA'2004 (Prague, November 15-16, 2004), Ph. Palanque, P. Slavik, M. Winckler (eds.), ACM Press, New York, 2004, pp. 75-82.
- Furtado, E., Furtado, V., Soares Sousa, K., Vanderdonckt, J., Limbourg, Q., *KnowiXML: A Knowledge-Based System Generating Multiple Abstract User Interfaces in UsiXML*, Proc. of 3rd Int. Workshop on Task Models and Diagrams for user interface design TAMODIA'2004 (Prague, November 15-16, 2004), to appear. Ph. Palanque, P. Slavik, M. Winckler (eds.), ACM Press, New York, 2004, pp. 121-128.
- Limbourg, Q., Vanderdonckt, J., *Addressing the Mapping Problem in User Interface Design with UsiXML*, Proc. of 3rd Int. Workshop on Task Models and Diagrams for user interface design TAMODIA'2004 (Prague, November 15-16, 2004), Ph. Palanque, P. Slavik, M. Winckler (eds.), ACM Press, New York, 2004, pp. 155-163.
- Stanciulescu, A., Limbourg, Q., Vanderdonckt, J., *Graful – modalitate de reprezentare a elementelor interfeței cu utilizatorul [Graph-based representation of user interface elements]*, Proc. of 1st National Conference on Computer-Human Interaction RoCHI'2004 (Bucharest, September 23-24, 2004), Trausan-Matu, C. Pribeanu (eds.), Polytechnic University of Bucharest, Bucharest, 2004, pp. 115-121.
- Mariage, C., Vanderdonckt, J., Beirekdar, A., Noirhomme-Fraiture, M., *DESTINE: outil d'aide à l'évaluation contextualisée de l'ergonomie des sites web*, Proc. of 16th Conférence Francophone sur l'Interaction Homme-Machine IHM'2004 (Namur, Aug. 30-September 3, 2004), Presses Universitaires de Namur, Namur, 2004, pp. 117-124.

- Limbourg, Q., Vanderdonckt, J., *Multimodality and Context-aware Adaptation*, Proc. of 18th IFIP World Computer Congress – Topical days “Building the Information Society” (Toulouse, 17-22 August 2004), R. Jacquart (ed.), Kluwer Academics Publishers, Dordrecht, 2004, pp. 427-432.
- Grolaux, D., Van Roy, P., Vanderdonckt, J., *Migratable User Interfaces: Beyond Migratory User Interfaces*, Proc. of 1st IEEE-ACM Annual International Conference on Mobile and Ubiquitous Systems: Net-working and Services MOBIQUITOUS’04 (Boston, August 22-25, 2004), IEEE Computer Society Press, Los Alamitos, 2004, pp. 422-430.
- Vanderdonckt, J., Beirekdar, A., Noirhomme-Fraiture, M., *Automated Evaluation of Web Usability and Accessibility by Guideline Review*, Proc. of 4th Int. Conf. on Web Engineering ICWE’04 (Munich, 28-30 July 2004), N. Koch, P. Fraternali, M. Wirsing (eds.), Lecture Notes in Computer Science, Vol. 3140, Springer-Verlag, Berlin, 2004, pp. 17-30. Best conference paper.
- Limbourg, Q., Vanderdonckt, J., Michotte, B., Bouillon, L., Lopez, V., *UsiXML: a Language Supporting Multi-Path Development of User Interfaces*, Proc. of 9th IFIP Working Conference on Engineering for Human-Computer Interaction jointly with 11th Int. Workshop on Design, Specification, and Verification of Interactive Systems EHCI-DSVIS’2004 (Hamburg, July 11-13, 2004). Lecture Notes in Computer Science, Vol. 3425, Springer-Verlag, Berlin, 2005, pp. 200-220.

3.2. Other Conferences

KOLP M.

- Ivan Jureta, Manuel Kolp, Stéphane Faulkner, T. Tung Do: *Patterns for Agent Oriented e-Bidding Practices*, In Proceedings of the 19th International Conference on Knowledge-Based Intelligent Information & Engineering Systems (KES 2005), Melbourne, Australia, Sept. 2004.
- H. Mouratidis, M. Kolp, S. Faulkner and P. Giorgini. *A Secure Architectural Description Language for Agent Systems*. In Proc. of the 4th International Joint Conference on Autonomous Agents and Multi-Agents Systems (AAMAS’05), Utrecht, The Netherlands, July 2005.
- S. Dehousse, S. Faulkner, P. Giorgini, M. Kolp and H.Mouratidis *Delegation Mechanisms for Agent Architectural Design*, In Proc. of the 5th IEEE International Joint Conference on Web Intelligence and Intelligent Agent Technology (IAT’05), Compiègne, France, Sept. 2005.
- F. Fouss, S. Faulkner, M. Kolp, M. Saerens, A. Pirotte, *Web Recommendation System based on a Markov Chain Model*. In Proceedings of the 7th International Conference on Enterprise Information Systems (ICEIS 2005), Miami, USA, May 2005.
- M. Kolp, I. Jureta, S. Faulkner, *Best Practices Agent Patterns for On-Line Auctions*. In Proceedings of the 7th International Conference on Enterprise Information Systems (ICEIS 2005), Miami, USA, May 2005.
- A. Coyette, S. Faulkner, M. Kolp, J. Vanderdonckt, Q. Limbourg. *SketchiXML: Towards a Multi-Agent Design Tool for Sketching User Interfaces Based on USIXML*. In Proceedings of the 3rd International Workshop on TAsk MOdels and DIAGrams for user interface design (TAMODIA 2004), Prague, Czech Republic, November 2004.

- S. Faulkner, M. Kolp, T. Nguyen and A. Coyette. *A Multi Agent Perspective on Data Integration Architectural Design*. In Proceedings of the 18th International Conference on Knowledge-Based Intelligent Information & Engineering Systems (KES 2004), Wellington, New Zealand, September 2004.
- L. Penserini, M. Kolp, L. Spalazzi, M. Panti and J. Mylopoulos. *Socially-Based Design of Distributed Agent System*, In Proceedings of the 2004 IEEE/WIC/ACM International Conference on Intelligent Agent Technology (IAT 2004), September 2004.
- S. Faulkner, M. Kolp, T. Nguyen, A. Coyette and T. T. Do. *Information Integration Architecture Development: A Multi-Agent Approach*. In Proceedings of the 16th International Conference on Software Engineering and Knowledge Engineering (SEKE 2004), Banff, Canada, July 2004.
- A. Coyette, M. Kolp and S. Faulkner. *Using Intelligent Agents to Build E-Business Software*. In Proceedings of the 4th International Conference on Electronic Business, Beijing, December 2004.

VANDERDONCKT J.

- Trevisan, D., Vanderdonckt, J., Macq, B., *Computer Vision Guidance in Medical Applications*, Proc. of 18th Brazilian Symposium on Computer Graphics and Image Processing SIBGRAP'2005 (Natal, 9-12 Oct.2005), IEEE Computer Society Press, Los Alamitos, 2005.

4. Other publications

4.1. Working Papers

ACHBANY Y.

A Multi-Agent Recommendation System Based on the Sharing of Knowledge Owned by Communities

Youssef Achbany*, Tai Nguyen*, Stéphane Faulkner, Manuel Kolp*, Yves Wautelet*

ABSTRACT.

To find information of quality from multiple heterogeneous sources is increasingly difficult. This problem finds its origin in the fast growth of the number of information available. The various formats used to store the data can also be problematic for the recommendation process. Nevertheless, for a community of people with similar interests, quality of results can be improved exploiting also the experience of the community. This experience can be shared and strengthened by all members of the same community to respond to their expectations by furnishing the best information on a specific topic. We propose an agent-based recommendation system for supporting communities of people in their searching task.

(148/05)

COYETTE A.

An Intelligent Tool for Sketching USIXML User Interfaces

Adrien Coyette, Stéphane Faulkner, Manuel Kolp, Quentin Limbourg, Jean Vanderdonckt,

ABSTRACT

During these last years, many researchers have proposed new alternatives for early interface design based on hand-sketch. But these new alternatives seem to be dedicated to obsolescence as they only offer the possibility to generate user interfaces for a single platform in a unique language. Indeed, in a context where the number of computing-platforms and system environments is exploding, new alternatives should be considered. This paper presents an innovating alternative with SketchiXML, a multi-agent application able to handle several kinds of hand-drawn sources as input, and to provide the corresponding specification in USIXML (User Interface eXtensible Markup Language), a platform-independent user interface description language.

(114/04)

Computer Assisted Sketching for the Early Stages of User Interface Design

Adrien Coyette and Jean Vanderdonckt,

ABSTRACT

Sketching activities are widely adopted during early design phases of user interface development to convey informal specifications of the interface presentation and dialog. Designers or even end users can sketch some or all of the future interface they want. With the ever increasing availability of different computing platforms, a need arises to continuously sup-

port sketching across these platforms with their various programming languages, interface development environments and operating systems. To address needs along these dimensions, which pose new challenges to user interface sketching tools, SketchiXML is a multi-platform multi-agent interactive application that enable designers and end users to sketch user interfaces with different levels of details and support for different contexts of use. The results of the sketching are then analyzed to produce interface specifications independently of any context, including user and platform. These specifications are exploited to progressively produce one or several interfaces, for one or many users, platforms, and environments

(136/05)

FOUSS F.

Web Recommendation System Based On A Markov-Chain Model

Francois Fouss, Stephane Faulkner, Manuel Kolp, Alain Pirotte, Marco Saerens

ABSTRACT

This work presents some general procedures for computing dissimilarities between nodes of a weighted, undirected, graph. It is based on a Markov-chain model of random walk through the graph. This method is applied on the architecture of a Multi Agent System (MAS), in which each agent can be considered as a node and each interaction between two agents as a link. The model assigns transition probabilities to the links between agents, so that a random walker can jump from agent to agent. A quantity, called the average first-passage time, computes the average number of steps needed by a random walker for reaching agent $??$ for the first time, when starting from agent $..$. A closely related quantity, called the average commute time, provides a distance measure between any pair of agents. Yet another quantity of interest, closely related to the average commute time, is the pseudoinverse of the Laplacian matrix of the graph, which represents a similarity measure between the nodes of the graph. These quantities, representing dissimilarities (similarities) between any two agents, have the nice property of decreasing (increasing) when the number of paths connecting two agents increases and when the “length” of any path decreases. The model is applied on a collaborative filtering task where suggestions are made about which movies people should watch based upon what they watched in the past. For the experiments, we build a MAS architecture and we instantiated the agents belief-set from a real movie database. Experimental results show that the Laplacian pseudo inverse based similarity outperforms all the other methods.

(123/04)

The Principal Components Analysis Of A Graph, And Its Relationships To Spectral Clustering

Marco Saerens, Francois Fouss, Luh Yen & Pierre Dupont

ABSTRACT

This work presents a novel procedure for computing (1) distances between nodes of a weighted, undirected, graph, called the Euclidean Commute Time Distance (ECTD), and (2) a subspace projection of the nodes of the graph that preserves as much variance as possible, in terms of the ECTD – a principal components analysis of the graph. It is based on a Markov-

chain model of random walk through the graph. The model assigns transition probabilities to the links between nodes, so that a random walker can jump from node to node. A quantity, called the average commute time, computes the average time taken by a random walker for reaching node j for the first time when starting from node i , and coming back to node i . The square root of this quantity, the ECTD, is a distance measure between any two nodes, and has the nice property of decreasing when the number of paths connecting two nodes increases and when the “length” of any path decreases. The ECTD can be computed from the pseudoinverse of the Laplacian matrix of the graph, which is a kernel. We finally define the Principal Components Analysis (PCA) of a graph as the subspace projection that preserves as much variance as possible, in terms of the ECTD. This graph PCA has some interesting links with spectral graph theory, in particular spectral clustering.

(124/04)

Hits Is Pca

Marco Saerens & Francois Fouss,

ABSTRACT

In this short paper, we show that Kleinberg’s hubs and authorities model (HITS) is simply Principal Components Analysis (PCA – maybe the most widely used multivariate statistical analysis method), albeit without centering, applied to the adjacency matrix of the graph of web pages. In addition to providing a new interpretation for HITS, this result suggests to rely on existing work, already published in the multivariate statistical analysis literature (extensions of PCA), in order to design new web pages ranking procedures.

(125/04)

KOLP M.

An Intelligent Tool for Sketching USIXML User Interfaces

Adrien Coyette, Stéphane Faulkner, Manuel Kolp, Quentin Limbourg, Jean Vanderdonckt,

ABSTRACT

During these last years, many researchers have proposed new alternatives for early interface design based on hand-sketch. But these new alternatives seem to be dedicated to obsolescence as they only offer the possibility to generate user interfaces for a single platform in a unique language. Indeed, in a context where the number of computing-platforms and system environments is exploding, new alternatives should be considered. This paper presents an innovating alternative with SketchiXML, a multi-agent application able to handle several kinds of hand-drawn sources as input, and to provide the corresponding specification in USIXML (USer Interface eXtensible Markup Language), a platform-independent user interface description language.

(114/04)

Web Recommendation System Based On A Markov-Chain Model

Francois Fouss, Stéphane Faulkner, Manuel Kolp, Alain Pirotte, Marco Saerens

ABSTRACT

This work presents some general procedures for computing dissimilarities between nodes of a weighted, undirected, graph. It is based on a Markov-chain model of random walk through the graph. This method is applied on the architecture of a Multi Agent System (MAS), in which each agent can be considered as a node and each interaction between two agents as a link. The model assigns transition probabilities to the links between agents, so that a random walker can jump from agent to agent. A quantity, called the average first-passage time, computes the average number of steps needed by a random walker for reaching agent k for the first time, when starting from agent i . A closely related quantity, called the average commute time, provides a distance measure between any pair of agents. Yet another quantity of interest, closely related to the average commute time, is the pseudoinverse of the Laplacian matrix of the graph, which represents a similarity measure between the nodes of the graph. These quantities, representing dissimilarities (similarities) between any two agents, have the nice property of decreasing (increasing) when the number of paths connecting two agents increases and when the “length” of any path decreases. The model is applied on a collaborative filtering task where suggestions are made about which movies people should watch based upon what they watched in the past. For the experiments, we build a MAS architecture and we instantiated the agents belief-set from a real movie database. Experimental results show that the Laplacian pseudo inverse based similarity outperforms all the other methods.

(123/04)

A Goal-Oriented Framework For Business Modeling

Ivan Jureta*, Manuel Kolp*, Stéphane Faulkner+, Yves Wautelet*

ABSTRACT

This paper proposes a modeling framework that provides rigorous concepts for conducting early organizational requirements analysis. The aim is to allow business analysts to produce an organizational model that precisely captures the knowledge of an organization and of its business processes. To this end, the framework offers a conceptual meta-model that identifies constructs that enable capturing the intrinsic characteristics of an organization setting for a corporate information system-to-be. The approach allows the analyst to have a holistic perspective integrating human and organizational aspects to gain better understanding of business system inner an outer modelling issues. The framework takes roots in both management theory and requirements analysis. It helps bridging the gap between enterprise and requirements models proposing an integrated vision, comprehensive and expressive to both managers and software (requirements) analysts.

(126/04)

On-line Bidding PatternsIvan Jureta¹, Manuel Kolp¹, Stéphane Faulkner² and T. Tung Do¹**ABSTRACT**

Today high volume of goods and services is being traded using online auction systems. The growth in size and complexity of architectures to support online auctions requires the use of distributed and cooperative software techniques. In this context, the agent software de-

velopment paradigm seems appropriate both for their modelling, development and implementation. This paper proposes an agent-oriented patterns analysis of best practices for online auction. The patterns are intended to help both IT managers and software engineers during the requirement specification of an on-line auction system while integrating benefits of agent software engineering.

(130/05)

An agent-oriented architecture for peer-to-peer information integration system

Tai Nguyen, Manuel Kolp

ABSTRACT

Peer-to-peer (P2P) computing facilitates the sharing of computer resources and services by direct exchange between systems. Nowadays, information integration is forced to build up open systems able to cope with distributed, heterogeneous, and dynamic information issues. P2P can potentially provide a more open integration that involves all participants on the network. Multi-Agent Systems (MAS) architectures are gaining popularity for building open, distributed, and evolving software required by such systems. They tend to be open and dynamic in the sense they exist in a changing organizational and operational environment where new components can be added, modified or removed at any time like the heterogeneous sources in a P2P network. This paper presents an agent-oriented P2P architecture, based on the Gnutella protocol, designed for information integration. Our system applies a multi-criteria search engine to increase efficiency of the P2P search as well as the integration of information.

(147/05)

NGUYEN D.

An agent-oriented architecture for peer-to-peer information integration system

Tai Nguyen, Manuel Kolp

ABSTRACT

Peer-to-peer (P2P) computing facilitates the sharing of computer resources and services by direct exchange between systems. Nowadays, information integration is forced to build up open systems able to cope with distributed, heterogeneous, and dynamic information issues. P2P can potentially provide a more open integration that involves all participants on the network. Multi-Agent Systems (MAS) architectures are gaining popularity for building open, distributed, and evolving software required by such systems. They tend to be open and dynamic in the sense they exist in a changing organizational and operational environment where new components can be added, modified or removed at any time like the heterogeneous sources in a P2P network. This paper presents an agent-oriented P2P architecture, based on the Gnutella protocol, designed for information integration. Our system applies a multi-criteria search engine to increase efficiency of the P2P search as well as the integration of information.

(147/05)

PIROTTE A.

Web Recommendation System Based On A Markov-Chain Model

Francois Fouss, Stephane Faulkner, Manuel Kolp, Alain Pirotte, Marco Saerens

ABSTRACT

This work presents some general procedures for computing dissimilarities between nodes of a weighted, undirected, graph. It is based on a Markov-chain model of random walk through the graph. This method is applied on the architecture of a Multi Agent System (MAS), in which each agent can be considered as a node and each interaction between two agents as a link. The model assigns transition probabilities to the links between agents, so that a random walker can jump from agent to agent. A quantity, called the average first-passage time, computes the average number of steps needed by a random walker for reaching agent j for the first time, when starting from agent i . A closely related quantity, called the average commute time, provides a distance measure between any pair of agents. Yet another quantity of interest, closely related to the average commute time, is the pseudoinverse of the Laplacian matrix of the graph, which represents a similarity measure between the nodes of the graph. These quantities, representing dissimilarities (similarities) between any two agents, have the nice property of decreasing (increasing) when the number of paths connecting two agents increases and when the “length” of any path decreases. The model is applied on a collaborative filtering task where suggestions are made about which movies people should watch based upon what they watched in the past. For the experiments, we build a MAS architecture and we instantiated the agents belief-set from a real movie database. Experimental results show that the Laplacian pseudo inverse based similarity outperforms all the other methods.

• Keywords: Collaborative Filtering, Markov Chains, Multi Agent System

(123/04)

SAERENS M.*Web Recommendation System Based On A Markov-Chain Model*

Francois Fouss, Stephane Faulkner, Manuel Kolp, Alain Pirotte, Marco Saerens

ABSTRACT

This work presents some general procedures for computing dissimilarities between nodes of a weighted, undirected, graph. It is based on a Markov-chain model of random walk through the graph. This method is applied on the architecture of a Multi Agent System (MAS), in which each agent can be considered as a node and each interaction between two agents as a link. The model assigns transition probabilities to the links between agents, so that a random walker can jump from agent to agent. A quantity, called the average first-passage time, computes the average number of steps needed by a random walker for reaching agent k for the first time, when starting from agent i . A closely related quantity, called the average commute time, provides a distance measure between any pair of agents. Yet another quantity of interest, closely related to the average commute time, is the pseudoinverse of the Laplacian matrix of the graph, which represents a similarity measure between the nodes of the graph. These quantities, representing dissimilarities (similarities) between any two agents, have the nice property of decreasing (increasing) when the number of paths connecting two agents increases and when the “length” of any path decreases. The model is applied on a collaborative filtering task where suggestions are made about which movies people should watch based upon what they watched in the past. For the experiments, we build a MAS architecture and we instantiated the agents belief-set from a real movie database. Experimental results show that the Laplacian pseudo inverse based similarity outperforms all the other methods.

(123/04)

The Principal Components Analysis Of A Graph, And Its Relationships To Spectral Clustering

Marco Saerens, Francois Fouss, Luh Yen & Pierre Dupont

ABSTRACT

This work presents a novel procedure for computing (1) distances between nodes of a weighted, undirected, graph, called the Euclidean Commute Time Distance (ECTD), and (2) a subspace projection of the nodes of the graph that preserves as much variance as possible, in terms of the ECTD – a principal components analysis of the graph. It is based on a Markov-chain model of random walk through the graph. The model assigns transition probabilities to the links between nodes, so that a random walker can jump from node to node. A quantity, called the average commute time, computes the average time taken by a random walker for reaching node j for the first time when starting from node i , and coming back to node i . The square root of this quantity, the ECTD, is a distance measure between any two nodes, and has the nice property of decreasing when the number of paths connecting two nodes increases and when the “length” of any path decreases. The ECTD can be computed from the pseudoinverse of the Laplacian matrix of the graph, which is a kernel. We finally define the Principal Components Analysis (PCA) of a graph as the subspace projection that preserves as much variance as possible, in terms of the ECTD. This graph PCA has some interesting links with spectral graph theory, in particular spectral clustering.

(124/04)

Hits Is PCA

Marco Saerens & Francois Fouss,

ABSTRACT

In this short paper, we show that Kleinberg’s hubs and authorities model (HITS) is simply Principal Components Analysis (PCA – maybe the most widely used multivariate statistical analysis method), albeit without centering, applied to the adjacency matrix of the graph of web pages. In addition to providing a new interpretation for HITS, this result suggests to rely on existing work, already published in the multivariate statistical analysis literature (extensions of PCA), in order to design new web pages ranking procedures.

(125/04)

VANDERDONCKT J.

An Intelligent Tool for Sketching USIXML User Interfaces

Adrien Coyette, Stéphane Faulkner, Manuel Kolp, Quentin Limbourg, Jean Vanderdonckt,

ABSTRACT

During these last years, many researchers have proposed new alternatives for early interface design based on hand-sketch. But these new alternatives seem to be dedicated to obsolescence as they only offer the possibility to generate user interfaces for a single platform in a unique language. Indeed, in a context where the number of computing-platforms and system environments is exploding, new alternatives should be considered. This paper presents an innovating alternative with SketchiXML, a multi-agent application able to handle several kinds of hand-drawn sources as input, and to provide the corresponding specification in

USIXML (User Interface eXtensible Markup Language), a platform-independent user interface description language.

- ACM Classification Keywords:

D.2.1 [Software Engineering]: Requirements/Specifications – elicitation methods (e.g., rapid prototyping, interviews, JAD). D.2.2 [Software Engineering]: Design Tools and Techniques – user interfaces. H.5.2 [Information Interfaces and Presentation]: User Interfaces – Multi-agents, Prototyping, Graphical User Interfaces (GUI). I.3.6 [Computer Graphics]: Methodology and Techniques – interaction techniques.

- General terms: Design, Languages, Human Factors.

- Author Keywords:

Development processes, multi-platform, multi-path development, user interface description language, multi-agent architecture, BDI, SKwyRL, interface sketching, user interface engineering.

(114/04)

Towards Virtualization of User Interfaces based on UsiXML

José Pascual Molina Massó^{1,2}, Jean Vanderdonckt², Francisco Montero Simarro^{1,2}, Pascual González

ABSTRACT

A model-based approach is presented for structuring a development process of virtual user interfaces based on UsiXML, a XML-compliant User Interface Description Language. UsiXML provides a Concrete User Interface description that remains independent from any toolkit, whether graphical or virtual. To support the rendering of this description in a virtual world, two toolkits have been developed: for VRML97 and X3D. The user interface description can be edited within an appropriate graphical editor, in 2D for instance, and leads to 2D or 3D rendering or an automated generation of a 2D graphical user interface in Java or a 3D virtual user interface in VRML97 or X3D, for both presentation and behaviour parts. When any element involved in the Concrete User Interface changes, the corresponding virtual user interface changes accordingly, thus reducing development time and complexity. In this way, a virtual user interface can be produced with the advantage of raising the level of abstraction with respect to any language. This paper focuses on the 3D user interfaces.

CR Categories: D.2.2 [Software Engineering]: Design Tools and Techniques – User interfaces. I.3.6 [Computer Graphics]: Methodology and Techniques – Interaction techniques. I.3.7 [Computer Graphics]: Three-Dimensional Graphics and Realism – Interaction techniques. H.5.1 [Information Interfaces and Presentation]: Multimedia Information Systems – Artificial, augmented, and virtual realities. H.5.2 [Information Interfaces and Presentation]: User Interfaces – Graphical user interfaces, input devices and strategies, interaction styles, user-centered design
Keywords: abstract user interface, concrete user interface, domain model, graphical user interface, task model, user interface, User Interface Description Language, UsiXML, virtual user interface, virtualization, XML.

(129/05)

Computer Assisted Sketching for the Early Stages of User Interface Design

Adrien Coyette and Jean Vanderdoncktc,

ABSTRACT.

Sketching activities are widely adopted during early design phases of user interface development to convey informal specifications of the interface presentation and dialog. Designers or even end users can sketch some or all of the future interface they want. With the ever increasing availability of different computing platforms, a need arises to continuously support sketching across these platforms with their various programming languages, interface development environments and operating systems. To address needs along these dimensions, which pose new challenges to user interface sketching tools, SketchiXML is a multi-platform multi-agent interactive application that enable designers and end users to sketch user interfaces with different levels of details and support for different contexts of use. The results of the sketching are then analyzed to produce interface specifications independently of any context, including user and platform. These specifications are exploited to progressively produce one or several interfaces, for one or many users, platforms, and environments.

(136/05)

Teh Amouh, Monica Gemo, Benoît Macq, Senior Member, IEEE, Jean Vanderdonck, Member, IEEE,

Abdul Wahed El Gariani, Marc Reynaert, Lambert Stamatakis, Frédéric Thys

Versatile Clinical Information System Design for Emergency Departments

(141/05)

YEN L.

The Principal Components Analysis Of A Graph, And Its Relationships To Spectral Clustering

Marco Saerens, Francois Fouss, Luh Yen & Pierre Dupont

ABSTRACT

This work presents a novel procedure for computing (1) distances between nodes of a weighted, undirected, graph, called the Euclidean Commute Time Distance (ECTD), and (2) a subspace projection of the nodes of the graph that preserves as much variance as possible, in terms of the ECTD – a principal components analysis of the graph. It is based on a Markov-chain model of random walk through the graph. The model assigns transition probabilities to the links between nodes, so that a random walker can jump from node to node. A quantity, called the average commute time, computes the average time taken by a random walker for reaching node j for the first time when starting from node i , and coming back to node i . The square root of this quantity, the ECTD, is a distance measure between any two nodes, and has the nice property of decreasing when the number of paths connecting two nodes increases and when the “length” of any path decreases. The ECTD can be computed from the pseudoinverse of the Laplacian matrix of the graph, which is a kernel. We finally define the Principal Components Analysis (PCA) of a graph as the subspace projection that preserves as much variance as possible, in terms of the ECTD. This graph PCA has some interesting links with spectral graph theory, in particular spectral clustering.

(124/04)

4.2. The Doctoral Program

KOLP M.

Doctoral Dissertations

- Quentin Limbourg, *Multi-Path Development of User Interfaces*, IAG School of Management, University of Louvain, November, 2004
- Tung Do: *A Social Patterns Framework for Designing Multi-agent Architectures for End-Users* – july 2005

On-going research projects

- Youssef Achbany : *Development of a Multi Agent Knowledge Sharing Platform for E-Business*
- Adrien Coyette: *SketchiXML: a Design Process for Sketching User Interfaces*
- Tai Nguyen : *An Organizational Multi-Agent Architecture for Heterogeneous Information Sources Integration*
- Yves Wautelet : *Multi-Agent Iterative Development for Managing Enterprise Information Systems*
- Hoang Thi Thuy Hang: *Development of a NFR Framework for Multi-Agent Architectures*

HOANG T.

Présentation “Avant-Projet”	11 juin 2004.
Sujet de la recherche :	<i>Development of a non-functional Framework for Multi-Agent Architectures</i>
Promoteur :	Manuel Kolp et Alain Pirotte.

5. International research activities

5.1. Workshops and Conferences

KOLP M.

- AOIS 2005, 8th International Bi-Conference Workshop on Agent Oriented Information Systems, July & November, 2005, Utrecht, The Netherlands & Klagenfurt, Austria
- VLDB 2004, 30th International Conference on Very Large Databases, 1-5 Septembre 2004, Toronto, Canada.

SAERENS M.

- FNRS contact group on *Machine learning* (one-day workshop).

VANDERDONCKT J.

- Vanderdonckt, J., Law, E. L-C., Hvannberg, E.T., International COST294 Workshop on User Interface Quality Models (UIQM'05) in conjunction with INTERACT'05, 12th - 13th September 2005, Rome, Italy.

5.2. Academic Visits (CEMIT)

KOLP M.

Visits to Other Institution

- Wellington Institute of Technology, New Zealand, September 2004
- Tshingua University, Beijing, China, December 2004
- Florida International University, Miami, USA, May 2005

Regular Visits to Other Institutions

- University of Trento, Department of Computer Science, Italy

VANDERDONCKT J.

Visits to Other Institutions

- SAP Munich
- University of Prague, Hongrie

Regular Visits to Other Institutions

- Université Joseph Fourier (Grenoble I), France
- Polytechnic University of Valencia, Espagne
- National Center for Research & Development in Informatics (ICI), Bucarest, Roumanie
- CNR, ISTI, Pise, Italie
- Thalès Research, Paris, France

6. Research Collaborations

6.1. Research Contracts (CEMIT)

KOLP M.

SKwyRL: Socio-Intentional ArChitecture for Knowledge Systems and Requirements ELicitation

Financial Support : FSR-UCL, CGRI-AUF

IAG Principal Investigator : Manuel Kolp

1 researcher Full Time for 4 years

Short description :

The project aims at identifying and developing a collection of specific social and intentional architecture patterns for designing agent-based systems. It proposes to use human organizations as a metaphor to suggest a set of generic patterns for agent systems, with a preference for organizational design theories over social emergence theories. Patterns from organization theory describe the internal structure of organizations while theories for strategic alliances model the external collaboration of independent organizations that pursue agreed goals. Design parameters such as task assignment, standardization, supervision, management control, and strategy definition will be used to handle situational and contingency factors. The research will formalize these social and intentional patterns, and characterize precisely how a particular model can be seen as an instance of a pattern. The patterns will be compared with software architecture patterns such as pipes-and-filters, event-based, layered, control loop, and related to lower-level (software) components, ports, connectors, interfaces, libraries and configurations. The project will also propose desirable qualities of social structures such as adaptivity, ease of coordination, predictability, and fault tolerance, and define methods for evaluating a given social structure with respect to a set of qualities.

Object-oriented modeling and development of production databases for steel manufacturing

Financial Support: Carsid SA, Walloon Region

IAG Principal Investigators : Manuel Kolp

1 researcher Full Time for 4 years

Short description :

The project models part of the production databases of the “Coke-Fonte-Energie” Operation Center of CARSID and their applications in order to progressively re-engineer them. Such databases are particular in the sense they manage synchronous data: thousands of variables are received every minute from numerous sensors all around the manufactories. The project also proposes the development of a master database that could be parameterized for the different CARSID manufactories.

Development of an information retrieval and data integration tool for e-business applications

Financial Support : FIRST Entreprise contract (Région Wallonne) in partnership with CITOBI S.A.

IAG Principal Investigators : Manuel Kolp

Short description :

The project consists in analyzing and developing a multi-agent platform based on social design patterns (broker, mediator, wrapper, monitor, matchmaker, ...) to propose information retrieval and data integration services for e-business applications. The platform follows an organizational architecture to integrate the patterns. The implementation is realized in a generic way allowing software components reuse, specifically within the JACK agent programming environment. The proposed approach follows BDI (Belief-Desire-Intention) cognitive specifications and FIPA (Foundation for Intelligent Physical Agents) recommendations.

A Multi-Agent Recommendation System Based for Sharing of Knowledge

Financial Support : FIRST Entreprise contract (Région Wallonne), Denali S.A.

Principal Investigators : Manuel Kolp, Marco Saerens

Short description :

This project proposes an agent-based recommendation system for supporting communities of people in their searching task. To find information of quality from multiple heterogeneous sources is increasingly difficult. This problem finds its origin in the fast growth of the number of information available. The various formats used to store the data can also be problematic for the recommendation process. Nevertheless, for a community of people with similar interests, quality of results can be improved exploiting also the experience of the community. This experience can be shared and strengthened by all members of the same community to respond to their expectations by furnishing the best information on a specific topic.

SAERENS M.

ON-GOING RESEARCH PROJECTS

Network Analysis, Clustering and Relationship mining (NACRE)

Financial Support : Région de Bruxelles-capitale (2005-2006)

Principal Investigator : Marco Saerens

Participating company : VADIS Consulting S.A.

Funding : about 250 000 Euro

Researchers : 1 person for two years

Short description :

This project is funded by the “Region de Bruxelles-Capitale” and has been introduced in partnership with “VADIS Consulting”, a data mining company closely related to “Wegener”. It allowed to hire one researcher for two years.

This applied research project aims to develop some novel statistical analysis and visualization methods for large, weighted, graphs. In particular, we are interested in the analysis of telecommunication networks, viewing the network of mobile phone calls as a weighted graph. The objective is to identify dense clusters of users (communities), which are highly connected, or “central persons” in the network. Identifying dense clusters or central users is important for several reasons; for instance in order to be able to forecast “churn”.

“Collaborative recommendation” project

Financial Support :	FIRST Enterprise contract – Région Wallonne(2004-2005)
Principal Investigator :	Marco Saerens
Participating company :	CITObI S.A.
Funding :	about 150 000 Euro
Researchers :	1 person for two years

Short description :

This project is funded by the “Region wallonne” and has been introduced in partnership with “CITObI”, an internet marketing automation and CRM company. It allowed to hire one researcher for two years.

This applied research project aims to develop some new collaborative recommendation methods, based mainly on new notions of distances on a graph. Collaborative recommendation models are mainly used to recommend items to users, based on their previous purchases (as in amazon.com). These novel concepts of distances are based on models of random walk on a graph (Markov models) and on the concept of “stochastic complementation”, that account for all the possible paths between two nodes (and not only the shortest one as for the geodesic distance). These dissimilarities are then used in order to compute the proximity between elements of different tables of a relational database. An industrial application, with the collaboration of CITObI, is under development.

A Multi-Agent Recommendation System Based for Sharing of Knowledge

Financial Support:	FIRST Enterprise contract – Région Wallonne(2005-2006)
Principal Investigators :	Manuel Kolp, Marco Saerens
Funding :	about 250 000 Euro
Participating company :	DENALI S.A.
Researchers :	1 person for two years

Short description :

This applied research project proposes an agent-based recommendation system for supporting communities of people in their searching task. To find information of quality from multiple heterogeneous sources is increasingly difficult. This problem finds its origin in the fast growth of the number of information available. The various formats used to store the data can also be problematic for the recommendation process. Nevertheless, for a community of people with similar interests, quality of results can be improved exploiting also the experience of the community. This experience can be shared and strengthened by all members of the same community to respond to their expectations by furnishing the best information on a specific topic.

Analysis of Network of Criminals

Financial Support:	Belgian Federal Police (2004-2005)
Principal Investigators :	Marie-Paule Kestemont, Marco Saerens
Funding :	about 20 000 Euro

Participating company : Belgian Federal Police

Researchers : 0

Short description :

This applied research project aims to analyse networks of criminals based on recently developed “social network” techniques. In particular, we are interested in the analysis of criminal data, viewing the network as a weighted graph. : two criminals are linked if they committed a “crime” (understood in a broad sense) together. The objective is to identify dense clusters of criminals (communities), which are highly connected, or “central persons” in the network. Detecting dense clusters or central users is important for several reasons; for instance it allows to identify communities operating together.

VANDERDONCKT J.

Name of the contract : Harmonia, Inc.

Financial Support : contrat direct

IAG Principal Investigator : Jean Vanderdonckt

Research Assistants : Quentin Limbourg, Adrien Coyette

Résumé du sujet :

Ce contrat a pour objectif de donner une consultance relative à la définition et l’utilisation d’un langage de spécification d’interfaces homme-machine pour des contextes d’utilisation différents.

Name of the contract : CARE Tech.

Financial Support : bourse de post-doctorat

IAG Principal Investigator : Jean Vanderdonckt

Research Assistants : Quentin Limbourg (bénéficiaire)

Résumé du sujet :

Ce contrat a pour objectif de définir un modèle de présentation concret, abstrait, en vue de leur incorporation dans la suite logicielle Oliva Nova© Model Execution.

ON-GOING RESEARCH PROJECTS

- 01/01/2005 – : External partner of the FWO research project “Ambient Intelligence” by EDM-LUC (Limburgs Universitair Centrum).
- 01/10/2004 – 30/9/2006 : MULPLEX research project (Automated generation of plastic multi-channel inter-faces for on-line courses and exercises based on a learner model), “First Objectif 1” research programme (Walloon Region, Convention n°EP1A320501 R054F/415737)
- 01/01/2005 – : European COST Action MAUSE “Towards The Maturation of IT Usability Evaluation” (European Commission, COST Action n°294)
- 01/11/2003 – 30/10/2006 : REQUEST research project (Rapid prototyping of e-commerce applications), “WIST” Wallonie Information Science & Technology research program (Walloon Region, Convention n°315592)
- 01/11/2003 – 30/10/2006 : DESTINE research project (Design & Evaluation Studio For

Intent-Based Ergonomic Web Sites), “WIST” Wallonie Information Science & Technology research program (Walloon Region, Convention n°315577)

- 01/12/2003 – 31/11/2006: The SIMILAR network of excellence (The European research taskforce creating human-machine interfaces SIMILAR to human-human communication), Sixth Framework Program (European Commission, FP6-IST1-2003-507609) – www.similar.cc, www.openinterface.org
- 01/9/2003 – 31/8/2004 : “Plasticité des Systèmes Interactifs” Research Action (CNRS-France, G. Calvary & M. Riveill)

