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QLectives introduction

QLectives is a project bringing together top social modelers, peer-to-peer engineers and physicists to design and deploy next generation self-organising socially intelligent information systems. The project aims to combine three recent trends within information systems:

- **Social networks** - in which people link to others over the Internet to gain value and facilitate collaboration
- **Peer production** - in which people collectively produce informational products and experiences without traditional hierarchies or market incentives
- **Peer-to-Peer systems** - in which software clients running on user machines distribute media and other information without a central server or administrative control

QLectives aims to bring these together to form Quality Collectives, i.e. functional decentralised communities that self-organise and self-maintain for the benefit of the people who comprise them. We aim to generate theory at the social level, design algorithms and deploy prototypes targeted towards two application domains:

- **QMedia** - an interactive peer-to-peer media distribution system (including live streaming), providing fully distributed social filtering and recommendation for quality
- **QScience** - a distributed platform for scientists allowing them to locate or form new communities and quality reviewing mechanisms, which are transparent and promote quality.

The approach of the QLectives project is unique in that it brings together a highly inter-disciplinary team applied to specific real world problems. The project applies a scientific approach to research by formulating theories, applying them to real systems and then performing detailed measurements of system and user behaviour to validate or modify our theories if necessary. The two applications will be based on two existing user communities comprising several thousand people - so-called "Living labs", media sharing community tribler.org; and the scientific collaboration forum EconoPhysics.

Executive Summary

This deliverable reports the publication and dissemination activities of the QLectives project consortium during the project's first reporting period.

The deliverable is divided into three parts. The first part presents the strategic impact of the project on science and innovation, and on supporting EU leadership in emerging areas of economic significance, as well as outlining the first steps taken to achieve long-term potential impact.

The second part presents the dissemination plan of the project in terms of research and development, as well as management activities.

The third part lists the publications produced by the consortium partners: journal articles, preprints, peer reviewed conference papers and compendiums, books and book chapters, as well as talks and presentations given by the QLectives partners, and work in progress.

Contents

1 Introduction

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2 Strategic impact

2.1 Strategic impact on science and innovation

The work undertaken in the QLectives project has a significant impact on the research into collaboration and P2P activities. The following aspects especially merit a mention.

Improvement of data mining algorithms

The ever-increasing availability of highly detailed data about user opinions and preferences fosters research in information filtering and data mining algorithms. Within the QLectives project, these algorithms are to serve both to assist users to find relevant content as well as to contribute to the creation of "collectives". The main achievements of the QLectives project in the recent period include:

- Proposal of a hybrid recommendation algorithm which alleviates the key dilemma of recommender systems: the choice between accuracy and diversity of recommendations. Our novel algorithm is able to simultaneously improve both these measures.

- Implementation of a new similarity index for link prediction in complex networks. Link prediction is a key challenge in complex systems from biological network to friendship networks in web society, and can be a promising method to extract useful hidden information. This similarity index provides very accurate predictions and is computationally less demanding than other standard indexes.

- Preliminary results on time-dependent algorithms which aim to use time information (e.g., the exact time when a rating was given by a user) in order to improve data mining algorithms. We showed that this approach can help to find fresh high-quality objects that would be overlooked by conventional time-neglecting algorithms.

- Numerical study of an adaptive recommendation model to determine whether high quality objects can stand evaluation bias and reach their intended audience (by evaluation bias we mean both intrinsically imperfect evaluations as well as intentionally malicious users).

- Implementation of a recommendation algorithm that can process gradually arriving information without the need of global re-computation and hence saves computational resources.

Network analysis of hypernetworks

QLectives research has introduced the use of hypernetworks (hypergraphs) rather than networks (graphs) as a relevant level to model collectives. In particular, attention has been focussed on the theoretical implications of using hypergraphs in network analysis. More precisely, the work has consisted of understanding how the use of hypergraphs is likely to affect observed and

observable patterns, mostly using through random hypergraph models. The second focus has been on the intertwining of social and semantic aspects of group formation; more precisely, on refining hypergraphic measures of group properties, and connecting them with quality measures. This aspect is likely to shed light on an important issue of QScience: the relationship between various notions of quality and underlying social structural patterns.

Trust in networks

Understanding the dynamics of networks is vital for the goals of the QLectives project. To this end, the QLectives partners have conducted research into social entrepreneurship and trust in networks. A theoretical basis for a model of the dynamics of trust on networks has been developed, combining processes of trust and social influence. The Open Source movement has been identified as a techno-social network of high quality, and the next stage is to study conflicts in open source communities. According to the initial qualitative analysis, ideological and technical conflicts can be identified. Ideological conflicts, usually initiated by newcomers to the group, tend to last long and be potentially damaging to trust in the community, whereas technical conflicts are resolved fast, resulting in common satisfaction and increased trust.

Modelling self-organised emergence of human collaboration and peer production

QLectives aims at combining peer production, social networking and P2P approaches in a productive way, in order to develop techno-social systems able to filter for high quality information. This objective requires new models to understand how constructive processes can emerge from users' behaviour and the dynamic social structures that they create. In addition to empirical analysis of research collaboration practices, a game-theoretical approach to study social norms and social phenomena such as cooperation or conflict has been adopted.

Emergence of and dynamics of quality

The emergence and dynamics of quality is one of the key themes of the QLectives project. To this end the project partners have developed a model of the emergence of quality standards and group dynamics in the emergence of quality judgments, i.e. how quality judgments emerge in a group discussion. This is a social influence process with standards of quality and eventually ranking of object with respect of their quality emerging as products of the process. The group converges on an agreed set of quality standards as a result of the social influence process. Dynamic theory of social impact describes the social dynamics of this process. Empirical studies on the emergence of quality standards, comprising volunteers being asked to rank a set of pictures in order of quality have been conducted, and a method for analysing dynamics of interactions in groups has been developed. Further work is being done to develop software for coding the data and visualising interactions. Also the theoretical basis for the dynamics of quality and several scenarios describing specific classes of the dynamics are being developed.

Motivations and practices of scientific collaboration

In terms of understanding the motivations and practices of scientific collaboration, QLectives has focussed on 1) theories of cooperative behaviour and cooperation in online communities, 2) patterns of scientific collaboration in online settings, and 3) analysis of existing collaborative online collaboration tools. Investigations have also covered the specific use of existing web 2.0 - based collaboration technologies by scientists. Finally, the team has analysed the functionalities offered and marketing approach adopted by existing collaboration tools. This provides valuable input to the final goal of the project, constructing the QScience platform, offering a comprehensive tool for scientific communities, including a range of functionalities such as archiving and commenting functions, ratings of both contributions and raters, provision of personalised information filters and self-organised community detection, data archives and data exchange tools, plus support for collaborations and project creation and management.

Research into online interaction behaviours (of interest to both QScience and QMedia) has provided insight into the design of models of socio-technical collectives. In particular, our research has explored the socio-semantic dynamics of local circles of interaction in blogspace by dynamically appraising individual linking patterns with respect to social (structural) proximity and semantic similarity.

QScience platform

The Econophysics Forum (www.unifr.ch/econophysics, hosted by the University of Fribourg), which a traditional meeting point for researchers from interdisciplinary physics, serves as an experimental platform for the QScience platform. This site has been enriched with new functions allowing users to create personal accounts and easily share, comment and evaluate the available resources. Users' personal pages now provide personalised recommendation of scientific papers based on users' previous interests, as well as lists of other users with similar interests, which is the first step in fostering scientific collaboration of the site's users. Newly implemented functions will be soon advertised among the users and their feedback and involvement will provide essential information for the future development of the QScience platform.

For the longer term, on-going plans are being discussed, towards a QScience roadmap, in which a bottom-up reviewing and journal system will be created to be tested with a new inter-disciplinary journal (working title: Q-Journal). The idea is that future versions of QScience will provide such Journal tools in addition to P2P extensions offering media sharing and distribution (including streaming video).

QMedia platform

Building on the existing Tribler media sharing client, QMedia v1 has been produced. This adds some additional P2P functionality to the Tribler client including distributed voting and rating for metadata and the formation of user controlled channels (or groups) to which will be able to publish comments. In addition prototype social networking and P2P-widget systems have been produced. Currently the social network and widget systems are not ready for

large-scale deployment but the voting, comments and channels should be deployed soon. From these deployments measurements of user behaviour in the system can be made.

2.2 Supporting EU leadership in emerging areas of economic significance

Addressing the skills and training gap in P2P technology

Currently, P2P developers are scarce due to the huge complexity involved in engineering and testing such systems, but, more importantly, there is a lack of any high quality courses in the public or private sector. To our knowledge, there are currently no systems level P2P programming courses available in the European Union (or even the United States). Hence P2P coders are often self-taught and initial experience is hard to find. The QLectives project is addressing this skill and training gap in P2P technology: for example the TUD group continues to train P2P programmers and researchers at MSc and PhD level. Several PhD students are working with QLectives topic areas and contributing to the code base of QMedia. All code developed within Tribler / QMedia is available as open source and attracts collaboration both within and outside the EU from both individuals, academics and SME's. Similarly, at USZ M. Jelasity has given an introductory course on P2P technology for PhD students. Visits are also being arranged between TUD and other partners (USZ and ETHZ) to work on skills and technology transfer.

Building the EU complexity community

QLectives partners have participated widely in the EU complexity community within both ASSYST (the associated Coordination Action of the COSI-ICT programme), the Complex Systems Society and the European Conference on Complex Systems (ECCS). The University of Surrey hosted the European Social Simulation Association's annual conference in September 2009. TUD will be hosting the IEEE conference P2P2010, a primary P2P conference. QLectives partners are also sponsoring and hosting the IEEE SASOS 2010 conference. Both of these conferences attract both academic and industrial researchers. Representatives of several QLectives partners participated in the ECCS2009 conference at Warwick University as both invited speakers and workshop organisers. This support will continue in 2010.

2.3 Potential long-term future impacts

The work done in the QLectives project is also predicted to have potential future long-term impacts. The following are the first steps taken to this direction, and thus merit a mention.

Next generation social networking

QMedia currently has only a prototype system for distributed social networking that is not yet deployable. It is on-going work to deliver a social networking function that is both decentralised, efficient and offers privacy options.

Techno-social inclusion

QMedia allows users to create channels and inject new content (torrents) into the system - which can be viewed and searched by other users - without the need for centralised websites or access to other accounts. Currently however, content needs to be indexed by centralised bit-torrent trackers. However, an initial prototype of decentralised tracker functions has been developed for deployment within Tribler. If successful future releases of QMedia will make use of these functions to provide fully distributed content indexing.

Techno-social operating system

QMedia currently has a prototype system for distributed deployment of P2P-Widgets, which allow for the dynamic injection of code, adding new functionality, into the system. However the currently security model is too limited to allow for general deployment. It is on-going work to address this with a possible redesigned widget architecture.

Scientific collaboration

Ambitious plans for a new form of scientific collaboration and publication, based on the QScience platform and incorporating the basic functions of an academic journal, a pre-print archive, a bookmarking site, and a social networking site, are being developed.

Dissemination plan

3.1   Research and development

The dissemination of QLectives results to the research community is one of the key goals of the consortium. To this end, the QLectives partners have engaged in publication and dissemination activities by submitting and publishing articles in international peer-reviewed journals and contributing to and participation at international conferences, workshops and summits. For early dissemination of the research results electronic preprint archives (arXiv.org, above all) have also been used. The publications and other dissemination activities of the QLectives project are listed in chapter 4.

Organising seminars and training events constitutes another important channel for developing ideas and disseminating results from the QLectives project. To this end, the University of Surrey and the CNRS teams organised an international workshop (QualityCommons, Maison de la Recherche, Paris, France, 28-29.1.2010) addressing, among other thing, emergence of quality in science, media and art. The workshop brought together contributions from a range of fields, including sociology, anthropology, economy, social epistemology, social psychology, cognitive science, social computing and complexity science, and offered the opportunity to develop ideas with a

selected interdisciplinary audience. The workshop aimed to (1) clarify research questions about the emergence of collective quality definitions; (2) consider preliminary ideas about the topic as applied to a number of domains (e.g. science, social computing, art, etc.), (3) promote links between participants to encourage the development and submission of research proposals on the topic; and (4) plan the writing of an edited book/special journal issue with chapters partly contributed by the participants and partly solicited via an open call for papers after the workshop.

Besides the usual channels of dissemination, QLectives is able to use two innovative dissemination methods. As QLectives in itself has provided two novel web platforms to distribute high-quality information, one related specifically to scientific contents (QScience), the other one to media contents (QMedia), it will take advantage of its own products to disseminate the project results. The living lab for the QScience platform, Econophysics Forum (www.unifr.ch/econophysics) , hosted by the University of Fribourg, has been made available to all those interested, allowing also for distribution of information from the QLectives project. The living lab for QMedia platform, Tribler (www.tribler.org) is also operational. In contrast to conventional forms of dissemination, which facilitate only one-way communication from disseminator to recipient, the QLectives platform will encourage a dialogue between the project and those interested in its work.

Simulation tools for simulating various aspects of P2P systems related to both QMedia and QScience have been constructed by the University of Szeged as part of the QLectives project. These simulation tools available under the LGPL license as part of our PeerSim P2P simulator on the SourceForge open source website, in the "peersim.extras" cvs directory (peersim.sf.net).

QLectives research has also been featured for non-scientific audiences. The QLectives project has for example been introduced in the 2009 annual report of the Institut für Rundfunktechnik. The article gives a brief overview of the project objectives, drawing attention to the rationale of the project. A hyperlink to the QLectives project web page allows interested persons to easily access detailed information. From a QLectives point of view, IRT's associates represent a key role regarding professional content, as well as means of archiving, distribution and content quality. Introducing the project's objectives to them at a rather early stage encourages exchange of valuable information, which will be introduced to and evaluated by the project consortium, in order to align the overall project design with all potential adapters. The QLectives partners in USZ have been also featured in a program of the Hungarian TV channel Halozat TV (www.halozattv.hu) and in their magazine Eur-ora in Spring 2009.

The QLectives consortium has also engaged in collaboration with artists with the attempt to disseminate the research results to a wider, non-scientific audience. As part of this collaboration, an exhibition called "Extremely rare events" devoted to presenting the perspective of complexity was organized by the Centre for Contemporary Art and the University of Warsaw team at Centre for Contemporary Art in Warsaw (10.8.-20.9.2009). The exhibition occupied the three largest exhibition halls of the museum. One room was devoted to science,

one to art and one to architecture. One of the themes of the conference was the dynamics by which products of extremely high quality (e.g. functional analysis in mathematics) are created. The emergence of extremely high quality was shown in terms of known mechanisms underlying extremely rare events. In connection with the exhibition, an open one day conference on complexity, networks and quality was organised. Further collaborations with the art world have included a public presentation on Warsaw as an emergent structure, and negotiations with the Centre for Contemporary Art in Warsaw on organising an exhibition on "Quality in self-organisation and emergence on techno-social networks".

3.2   Management

A web portal has been created for the QLectives project in order to facilitate the public dissemination of project information and results. The web portal, built on the MediaWiki platform, includes information about the project structure, vision, challenges and objectives as well as all dissemination material of the project. The website also includes a private section for the use of the QLectives consortium partners for the purposes of research collaboration, coordination and dissemination of information. The QLectives web portal is located at URL www.qlectives.eu
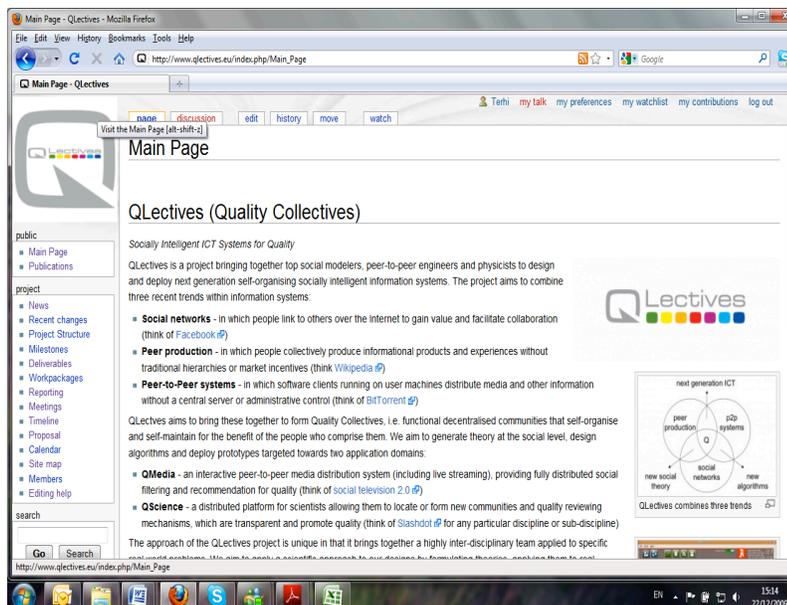

Figure 1: QLectives web portal

In order to facilitate the visibility of the QLectives project a logo for the project was also commissioned by the University of Surrey team. This logo is used on the QLectives web portal, deliverables and reports, and on the slide template.

Figure 2: Qlectives logo

4 Collection of publications

During the first 12 months of the QLectives project, the QLectives partners have completed a series of publications, and engaged in the following dissemination activities.

4.1 Journal articles

Helbing, D. & Lozano, S. "Routes to Cooperation and Equilibrium Creation in the Prisoner's Dilemma". Submitted to *Physical Review E.*

Helbing, D.; Szolnoki, A.; Perc, M. & Szabó, G. "Evolutionary establishment of moral and double moral standards through spatial interactions". Submitted to *PLoS Computational Biology.*

Helbing, D. & Johansson, A. (2010). "Evolutionary Dynamics of Populations with Conflicting Interactions: Classification and Analytical Treatment Considering Asymmetry and Power". *Physical Review E* 81, 016112, 2010.

Lü, L.; Jin,C. & Zhou, T. (2009). Similarity index based on local paths for link prediction of complex networks. *Physical Review* E 80, 046122, 2009.

Nowak, A.; Deutch, M.; Bartkowski, W. & Solomon. S., (in press). From crude law to precise formalism. *Peace and Conflict: Journal of Peace Psychology.*

Ormandi,R.; Hegedus, I. & Jelasity, M. Overlay Management for Fully Distributed User-based Collaborative Filtering. Submitted for publication.

Praszkier, R.; Nowak, A. & Coleman, P. T. (2010). *Peace and Conflict: Journal of Peace Psychology.*

Tabourier, L.; Roth, C. & Cointet, J. Generating constrained random graphs using multiple edge switches. Paper submitted to *ACM JEA Journal of Experimental Algorithmics.*

Taramasco, C.; Cointet, J. & Roth, C. Academic team formation as evolving hypergraphs. Paper submitted to *Scientometrics.*

Tölgyesi, N. & Jelasity, M. (2009). Adaptive peer sampling with newscast. In Henk Sips, Dick Epema, and Hai-Xiang Lin, editors, Euro-Par 2009, volume 5704 of *Lecture Notes in Computer Science*, pages 523–534. Springer-Verlag, 2009.

Whalen, J. M.; Pexman, P.M., & Gill, A.J. (2009). "Should Be Fun—Not!": Incidence and Marking of Nonliteral Language in E-Mail. *Journal of Language and Social Psychology*, September 2009; 28: 263 - 280.

Zhou, T.; Kuscsik, Z.; Liu, J., Medo, M.; Wakeling, J. R. & Zhang, Y. Solving the apparent diversity-accuracy dilemma of recommender systems. *PNAS* (Forthcoming March 2010)

4.2 Preprints

Jin, C.; Liu, J.; Zhang, Y. & Zhou, T. Adaptive information filtering for dynamic recommender systems. arXiv:0911.4910

Jiang, L.; Medo, M.; Wakeling, J.R.; Zhang, Y. & Zhou, T. Building reputation systems for better ranking. arXiv:1001.2186

4.3 Peer reviewed conference papers and compendiums

Cointet, J. & Roth, C. (2010). Local circles, local topics: structural and semantic proximity in blog networks. Paper submitted for review for 4th Intl AAAI Conf on Weblogs and Social Media, Washington, DC, 23-26 May 2010.

Gill, A. J.; Nokkala, T. & Gilbert, G. N. (2010). Patterns of Adoption of Science 2.0. Paper submitted for review for 4th Int'l AAAI Conference on Weblogs and Social Media, George Washington University, Washington, DC, 23-26 May 2010.

Gill, A. J.; Nowson, S. & Oberlander, J.(2009). What are they blogging about? Personality, topic and motivation in blogs. *Proceedings of the 3rd International AAAI Conference on Weblogs and Social Media*. San Jose, California,17-20 May 2009.

Hales, D.; Rahman, R.; Zhang, B.; Meulpolder M. & Pouwelse J. (2009). BitTorrent or BitCrunch: Evidence of a credit squeeze in BitTorrent? *Proceedings of the 5th*

Collaborative Peer-to-Peer Systems (COPS) Workshop, in conjunction with 18th IEEE International Workshops on Enabling Technologies: Infrastructures for Collaborative Enterprises, Groningen, the Netherlands, 29 June - 1 July 2009.

Rahman, R.; Meulpolder, M.; Hales, D:, Pouwelse J. & Sips, H. (2010). Improving Efficiency and Fairness in P2P Systems with Effort-Based Incentives. To be published in *Proceedings of the IEEE International Conference on Communications*, Cape Town, South Africa, 23-27 May 2010.

Rahman, R.; Hales, D.; Meulpolder, M.: Heinink, V.; Pouwelse, J. & Sips, H. (2009). Robust vote sampling in a P2P media distribution system. *Proceedings IPDPS 2009 (HotP2P 2009)*, IEEE Computer Society.

4.4 Books and book chapters

Helbing, D.& Nowak, A. (2009). Dynamika Tłumu / Dynamic of the Crowd. In: Wasilkowska, A.& Nowak, A. (eds.) (2009). Warszawa jako struktura emergentna: Em_Wwa 1.0; Warsaw as Emergent Structure: Em_Wwa 1.0 Warszawa. Warsaw: Fundacja Bęc Zmiana, pp. 55-61.

Nowak, A. (2009). Dynamiczny minimalizm: dlaczego w psychologii mniej znaczy więcej/ Dynamical Minimalism: Why less is more in Psychology. In: Wasilkowska, A.& Nowak, A. (eds.) (2009). Warszawa jako struktura emergentna: Em_Wwa 1.0; Warsaw as Emergent Structure: Em_Wwa 1.0 Warszawa. Warsaw: Fundacja Bęc Zmiana, pp. 35-47

Nowak, A. & Solomon, S. (2009). Więcej znaczy inaczej / More is Different. In: Wasilkowska, A.& Nowak, A. (eds.) (2009). Warszawa jako struktura emergentna: Em_Wwa 1.0; Warsaw as Emergent Structure: Em_Wwa 1.0 Warszawa. Warsaw: Fundacja Bęc Zmiana,pp. 49-53.

Wasilkowska, A.& Nowak, A. (eds.) (2009). Warszawa jako struktura emergentna: Em_Wwa 1.0; Warsaw as Emergent Structure: Em_Wwa 1.0 Warszawa. Warsaw: Fundacja Bęc Zmiana.

4.5 Talks and presentations

Brax, N. & Amblard, F. (2009). A self-repairing solution for the resilience of networks to attacks and failures. Presented at the European Conference on Complex Systems 2009, University of Warwick, UK, 21-25 September 2009.

Gill, A. J.; Nowson, S. & Oberlander, J.(2009). What are they blogging about? Personality, topic and motivation in blogs. Paper presented at the 3rd International AAAI Conference on Weblogs and Social Media. San Jose, California,17-20 May 2009.

Gill, A. J. & Gilbert, G. N. (2009). Web 2.0, its influence in academic software, and the future of academic collaboration. Paper presented at the Academia 2.0 and beyond – How Social Software changes research and education in academia workshop at the European Conference on Computer-Supported Cooperative Work, Vienna, Austria, 8 September 2009.

Gill, A. J. (2009). Social Information in Computer-Mediated Communication. Invited talk at the HCI Research Group Seminar Series, University of York, 29 October 2009.

Hales, D. (2009). QLectives – Socially Intelligent systems for Quality Collectives. Presentation at the ASSYST (COSI-ICT CA) Kick-off meeting, Institut des Systèmes Complexes, Paris, France, 27 February 2009.

Hales, D. (2009). BitTorrent or BitCrunch: Evidence of a credit squeeze in BitTorrent? Presentation at the 18th IEEE International Workshops on Enabling Technologies: Infrastructures for Collaborative Enterprises - WETICE 2009 (COPS workshop), Groningen, the Netherlands, 29 June 2009.

Hales, D. (2009). Tribler. Invited talk at the European Conference on Complex Systems 2009, COSI-ICT'09, University of Warwick, Coventry, UK, 21-25 September 2009.

Hales, D. & Gilbert, G. N. (2009). QLectives – Socially Intelligent systems for Quality Collectives. Presentation at the European Conference on Complex Systems

2009, COSI-ICT'09: First International Workshop on Complex Systems for Socially Intelligent ICT, University of Warwick, Coventry, UK, 22 September 2009.

Helbing, D. (2009). The Role of Mobility for the Outbreak of Cooperation among Egoists, Meeting of the Leopoldina, German Academy of Sciences, Zurich, Switzerland, 5 March 2009.

Helbing, D. (2009). Spontaneous Outbreak and Breakdown of Human Cooperation, Minerva International Workshop on "The Science of Complexity", Eilat, Israel, 30 March 2009.

Helbing, D. (2009). Behavior of crowds and socio-inspired technology: prospects for a dialogue between the engineering, natural and social sciences, series of events on simulation and data analysis IAS (Institute for angewa), Wädenswill, Switzerland, 8 May 2009.

Helbing, D. (2009). Cooperation and Conflict in the Prisoner's Dilemma and the Emergence of Norms, CCSS Workshop in ETH Zurich: Coping with Crises in Complex Socio-Economic Systems, Zurich, Switzerland, 8 June 2009.

Helbing, D. (2009). Cooperation and Conflict in the Prisoner's Dilemma and the Emergence of Norms, Workshop on Traffic: Managing the Complexity of Large Logistic Transport Systems by bio-inspired strategies, Venice, Italy, 3 July 2009.

Helbing, D. (2009). A kinetic approach to game theory: From opinions to norms, Workshop: Kinetic and Mean-field models in the Socio-Economic Sciences, Edinburgh, United Kingdom, 27 July 2009.

Helbing, D. (2009). How Social and Collective Human Behavior are Born from Simple Individual Interactions, Meeting of the Cognitive Science Society, Symposium: The Emergence of Collective Structures Through Individual Interactions", Amsterdam, Netherlands, 31 July 2009.

Helbing, D. (2009). Cooperation, Norms, and Revolutions: A Unified Game-Theoretical Approach, Keynote Talk at ECCS 2009, Warwick, United Kingdom, 21 September 2009.

Helbing, D. (2009). Cooperation and Conflict in the Prisoner's Dilemma and the Emergence of Norms, Autumn Meeting of the Modeling and Simulation Section of the German Society for Sociology: "Social Networks and Social Integration", Groningen, Netherlands, 24 October 2009.

Helbing, D. (2009). Towards Probing Foundations of Society by Computer Simulations, Max-Planck Institute for Evolutionary Biology, Plön, Germany, 13 November 2009.

Helbing, D. (2009). Cooperation, Norms, and Conflict: Towards Simulating the Foundations of Society (Keynote Talk), EURACE Workshop, Genoa, Italy, 20 November 2009.

Helbing, D. (2009). Cooperation, Norms, and Conflict: Towards Simulating the Foundations of Society, Conference on Rational-Choice: Theoretical models and empirical applications, Venice, Italy, 3 December 2009.

Helbing, D. (2009). Cooperation, Norms, and Conflict: Towards Simulating the Foundations of Society, Paris Interdisciplinary PhD Symposium "From sparse entities to crowded environments: Numbers in living systems", Paris, France, 7 December 2009.

Helbing, D. (2009). Self-Organization and emergence in social systems. Modeling the co-evolution of social environments and cooperative behavior, ATACD Conference: "Changing cultures: Cultures of change", Barcelona, Spain, 10 December 2009.

Jelasity, M. (2009). QLectives: Socially Intelligent Systems for Quality. Seminar of the Institute of Informatics, Univ. Szeged. April 2009.

Jelasity, M. (2009). Gossip-based Strategies in Global Optimization. invited plenary talk, Annual meeting of the Hungarian Operations Research Society, Szeged, November 2009.

Lozano, S. (2009). Techno-social systems supporting socially constructive processes in a self-organized fashion, European Commission's Expert Consultation Workshop "Shaping the Future" , Brussels, Belgium, 4 November 2009.

Roth, C. (2009). Co-évolution entre réseaux sociaux et opinions: le cas de la blogosphère. Invited talk at the MASHS 2009 conference in Toulouse, France, 8-9 June 2009.

Roth, C. (2009). Reciprocal influence of social and semantic patterns in a dynamic blog network. Invited communication at the DOOCN-III workshop at ECCS 2009, Warwick, UK, 23-24 September 2009.

Scissors, L.; Gill, A. J., & Gergle, D. (2009). "You Can Trust Me", "I Can Trust You": Linguistic Accommodation and Trust in Text-based CMC. Paper presented at the 2009 Annual Conference of the International Communication Association, Chicago, IL, May 2009.

Tölgyesi, N. & Jelasity, M. (2009). Adaptive peer sampling with newscast. Presented at EuroPar 2009, August 2009.