DAGSTUHL SEMINAR: Physical-Cyber-Social Systems, Challenges and Opportunities

SEP 30 - OCT 4

AGENDA

Sun - WELCOME

Sunday afternoon: Participants will arrive to Dagstuhl. We can arrange a list of arrivals and departures to Dagstuhl

Mon - INTRO

09:00-09:30 Introductions
09:30-10:30 (**Amit Sheth**- PCS computing - an introduction. 30mins talk, 30mins discussion)
10:30-11:00 breaks
11:00-12:00 (Tutorial/Overview Talk, **Noshir Contractor,** 30mins talk, 30mins discussion)
lunch
13:30-15:30 (introduction of participants: every participant gets a chance to say something. no slides)
15:30-16:00 breaks
16:00-17:30 ("Birds of a feather", identify 3-4 key areas, who is interested, key challenges, why they are important, present at the end of the week) (Organisers will present some topics to form the working groups around Physical, Cyber and Social themes -some suggestions are included below, Moderator: Payam Barnaghi).

Tue - DATA

09:00-10:00 (Tutorial/Overview Talk + Q/A) (**Ramesh Jain** - stream processing and situation awareness, 30mins talk, 30mins discussion)
10:00-10:30 breaks
10:30-12:00 (4* 15+5 min short talks by selected participants) (SHORT-DATA: Michael Granitzer, Manfred Hauswirth, Schahram Dustdar)
lunch
14:00-15:30 Panel (the short-talk presenters above to participate as panelists, Moderator: Ramesh Jain)
15:30-16:00 breaks
16:00-17:30 Working groups (independently organized)

Wed - SOCIAL
09:00-10:00 (Tutorial/Overview Talk + Q/A) (**Ciro Cattuto,** 30mins talk, 30mins discussion)
10:00-10:30 breaks
10:30-12:00 (4* 15+5 min short talks by selected participants) (SHORT-SOCIAL: Matthew Rowe, Claudia Müller-Birn, Harith Alani, Andreas Hotho)
lunch
14:00-15:30 Panel (the short-talk presenters and Ciro Cattuto will participate as panelists, Markus as moderator)
15:30-16:00 breaks
16:00-17:30 (Presentation of Working Group Results, 15 mins presentation + 15mins discussion per group)

Thu- SEMANTICS
09:00-10:00 (Tutorial/Overview Talk + Q/A) (**Steffen Staab-** Semantics)
10:00-10:30 breaks
10:30-12:00 (4* 15+5 min short talks by selected participants) (SHORT-SEMANTICS: Kerry Taylor, Laura Hollink, Axel Polleres)
lunch
14:00-15:30 Panel (the short-talk presenters above to participate as panelists, Moderator: Steffen Staab)
15:30-16:00 breaks
16:00-17:30 Working groups (independently organized)

Fri - CLOSING
09:00-10:00 (Tutorial/Overview Talk + Q/A) (**Geert-Jan Houben,** 30mins talk, 30mins discussion)
10:00-10:30 breaks
10:30-12:00 (Summary & Conclusion by the co-organizers, Amit Sheth/Steffen Staab/Ramesh Jain)

Talks:

Noshir Contractor
Title: Some Assembly Required: Organizing in the 21st century

Abstract

Recent technological advances provide comprehensive digital traces of social actions, interactions, and transactions. These data provide an unprecedented exploratorium to model the socio-technical motivations for creating, maintaining, dissolving, and reconstituting into teams. Using examples from research on collaboration in science, software development and massively multiplayer online games, Contractor will argue that Web Science serves as the foundation for the development of social network theories and methods to help advance our ability to understand the emergence of effective teams. More importantly, he will argue that these insights will also enable effective teams by building a new generation of recommender systems that leverage our research insights on the socio-technical motivations for creating ties.

Ramesh Jain

Title: Smart Social Systems

Abstract : Availability of enormous volumes of heterogeneous Cyber-Physical-Social (CPS) data streams may allow design and implementation of networks to connect various data sources to detect situations with little latency. In fact, in many cases it may even be possible to predict situations well in advance. This opens up new opportunities in designing smart social systems for specific tasks. Such systems may be very useful for many important problems at local as well as regional and even global level. We believe that such systems offer many novel challenges to researchers in multimedia, particularly in social and cross-modal media systems. We will present our ideas and challenges derived from our early experience towards building smart social systems.

Geert-Jan Houben:

Title: Weaving the Social Web into User Modeling and Adaptation

Abstract: The social web is having a clear impact in the field of user modeling and adaptation. On the social web a large source of data s generated by users themselves, often for different purposes, and that provides an unprecedented potential for systems to understand their users and to adapt based on that understanding. As we can see from researchers and projects in a number of relevant fields, data on various manifestations of what users do socially on the web brings new opportunities. Exciting ideas are generated and first explorations show promising results. In this talk we aim to understand the impact on methods and techniques for user modeling and adaptation. We also look forward by identifying challenges that can drive our research.

Michael Granitzer:

Title: Human-Machine Cooperation in Research

Abstract: While Machines process enormous processing capabilities, the lack Humans creativity, intuition and common sense background knowledge. A circumstance unlikely to be changed within the next few years, if ever. In this talk i aim to briefly highlight recent developments in machine learning and outline the need for a tighter integration of machines and humans for upcoming data challenges. Particular emphasis will be placed on data challenges in research and the Giant Global Graph as all encompassing database.

Axel Polleres

Title: Towards Linked Closed Data?

Abstract:
In the current trend for open Data, a lot of optimism is join into the belief that efforts like Linked Open Data from public sources will enrich and enable the usage of closed sensing data from all kinds of sources, and that aggregated dynamic sensing data will again be potentially published openly. However, various variables are unbound in this equation: How private can data in physical-cyber-social computing be? Can linked open data be trusted? How can physical-cyber-social-data be protected? How can data be charged and what's the value of aggregated data? I don't have answers to these questions but I'd like to discuss these issues in the workshop along with a roadmap and strategies on enabling technologies to answer them.

Andreas Hotho

Title: Social and Sensor Information - Two Views on the World

Abstract: In the last decade the social web emerged and had a strong influence on everyone's daily live. Today, most of the newly bought mobile phone are smartphones which have a bunch of additional sensors on board. Using this novel combination of sensor information and opinions of users uttered in the social web will lead to a new level of information quality. This talk will discuss this emergent new area along examples from the EveryAware project. We will use the results to illustrate and explain the future changes and challenges.

Manfred Hauswirth

Big Money and NSA^2 - the future for Physical-Cyber-Social Computing?

It is an established fact that we produce enormous amounts of static and dynamic information. This information is exploited to a certain extent already. Research focused on making this information accessible in a simple fashion (infrastructures), ways of scalable data integration in open environments (Linked Data, ontologies) and putting data to use (analytics, smart cities, etc.). A lot of business opportunities are predicted in this area. However, the systems are not mature enough yet and a lot of research is still required. Additionally, if successful, the flipside of this success will be that we may completely lose any privacy as we can then be monitored comprehensively in the real and in the online worlds. The question is how we can do good research while not making the job of the NSA even easier as it is already. Everyone talks about privacy and actually offer and apply it. In this talk, I will quickly review the existing state of the art, some of the driving requirements (in my opinion) and issues the research community must turn their attention to (again my personal opinion).

Schahram Dustdar

Title: Principles of Elastic Systems - Towards building Cyber-Physical-Social Systems

Harith Alani

Title: From smart meters to smart behaviour

Matthew Rowe

Title: 'Identity: Physical, Cyber, Future'

Abstract: Social web systems offering communication functionality allow users to form groups, make connections and shape their identity over time. The development of identity, and the theoretical underpinnings that currently explain such developments, are based on psychoanalysis grounded by real-world, physical experiences. In this talk I will explain how such theories transcend physical-cyber boundaries and that users also exhibit identity crises in social web systems when interacting in a cyber environment. Such a transcendent phenomena leads to questions such as: how can identity be defined in the future? Does

behaviour diffusion occur between the cyber and physical worlds? And how can we pre-empt physical decisions through cyber-based analyses?

Kerry Taylor
Title: Physical-Cyber-Social Agriculture

Abstract: Many of the major challenges facing the world in the decade ahead are focused on food production: feeding the growing population; preserving biodiversity; mitigating and responding to climate change. As scientists, we dedicate ourselves to reducing uncertainty, whereas practicing farmers are daily experts in decision-making under uncertainty. How can we improve the precision and reliability of information for farm management?
How can we make that information more directly actionable in the farmer's knowledge-intensive world?
And are the future technology developments a threat to the best of traditional rural lifestyle and culture?

Claudia Müller-Birn
Title: Using Insights from Social Computing to Augment Automotive Sensory Data

Abstract: Social computing systems provide added value by processing user information created by social interactions. Based on a couple of examples we show how these added values are realized in the Web and what challenges exist to tape the whole potential of these systems. Nowadays, ideas from social computing are entering completely new areas such as in the automotive industry. The car manufacturer Ford, for example, provides freely and at no cost its Sync AppLink to any automaker. The idea is to have a shared platform for developers to create novel apps based on sensory data. We enter this emerging area by presenting first results from a project on car data we have carried out recently and show, how car data can provide benefit to humans or web services. We conclude the talk by highlighting existing drawbacks and discussing implications for future research.