

Sunday: Kickoff

0930-1000 Introductions and Aspirations for the Week

1000-1100 Overview of Major Topics (The Four Deep Dives)

1100-1145 1-Slide Introductions from All Participants

“Who I am, my personal grand challenge in Physical and Pervasive Computing (i.e., What I would like 30 brains to discuss this week)”

1145-1230 How the week will work...his is not a traditional workshop!

Crowdsourced agenda optimization and finalization.

Structuring the Deep Dives.

Common questions & themes to explore.

1230-1600 Lunch and afternoon self-assembled small group informal discussions.

1600-1800 Hands-On Laboratory Session 1: Constructing Your Wearable Mote

[NO previous electronics/hardware/software experience required]

A wearable sensing and input/output system will be built by each participant (with help for those who are not hackers). The system will include fixed nodes located throughout the venue and is intended to be generative for rapid prototyping of applications using location, participatory sensing, various standard sensors, etc. A system overview primer will be provided well in advance of the workshop.

Other Notes

All participants: Please consider titles and slots below and email the Dive Coordinator with a confirmation or suggestion for a different talk. If you wish to give a talk (or 2nd talk) in a different session please email the relevant Dive Coordinators.

Keynotes are 20 minutes; Short talks are 5-7 minutes.

For short talks, Pecha-Kucha or minimal/no slides is strongly encouraged, as are props and show-and-tell.

Each afternoon will come with a "charge" which will include questions to explore, in most cases intended to stimulate experiments to be done in the lab that afternoon.

Monday: Embedding Intelligence in the Urban Built Environment

Sustainable cities, transportation, environment, energy, safety...

Dive Coordinators: Douglas Pancoast, Christoph Wartmann, Bo Rodda

0830-1000 Cities and People

Keynote: "Cities, Persons, and People" (Douglas Pancoast, School of the Art Inst. of Chicago)

ShortTalk: "New Songdo and Instant Cities" (Changyu Wang, SUV)

1030-1130 Buildings

Keynote: "Transformable Robotic Architecture" (Miles Kemp, Variate Labs)

ShortTalk: "Ubiquitous Sensing in Buildings" (C.S. Pyo, ETRI)

ShortTalk: "Building TOPIC TBD" (Bo Rodda, ANL)

1130-1230 Transportation and Movement

Keynote: "Living in a Smart City" (George Aye, School of the Art Inst. of Chicago)

ShortTalk: "Simulating Traffic" (Hubert Ley, ANL)

1230-1600 Lunch & afternoon self-assembled small group informal discussions.

Afternoon Charge: (TBA)

1600-1800 Hands-On Lab

Tuesday: Health and Human Interactions

Healthcare applications, facilitating human interaction with complex systems/environments via interaction of mobile and embedded computing, intuitive interactions between (non-technical) humans and sensors (and sensor data).

Dive Coordinators: Jeff Burke, Kevin Patrick, John Manning, Stacy Lindau

0830-1000 The Exposome in Health and Wellness

Keynote: "The Exposome" (Kevin Patrick, UCSD)

ShortTalk: "Mapping the Urbanome" (Stacy Lindau, UChicago)

ShortTalk: "Participatory Sensing / Civic Computing" (Jeff Burke, UCLA)

1030-1130 Human-Computer Interfaces: From data capture to user experience

Keynote: "Microinteractions" (Daniel Ashbrook, Nokia)

ShortTalk: "Communicating Health Data" (Brad Hesse, NIH)

ShortTalk: "Multi-user Experiences" (Miles Kemp, Variate Labs)

1130-1230 Design Patterns for the Internet of Things, Places, Experiences

Keynote: "Privacy, play, and interaction with public displays" (Marc Langheinrich, USI)

ShortTalk: "Social objects: browsing social networks through everyday things" (Iñaki Vázquez, Symplo)

ShortTalk: "HealthATM" (Thomas Horan, Claremont Graduate Univ)

ShortTalk: "Role of Objects/Devices in Place-Making" (Bo Rodda, ANL/SAIC)

1230-1600 Lunch and afternoon open for small group informal discussions.

Afternoon Charge: (TBA)

1600-1800 Hands-On Lab

Wednesday: Sensor Data Streams

Stream organization, management, sharing, analysis and visualization, privacy and security. At the outset of many pervasive applications lies a steady stream of sensor information, collected from sensors that are placed in the environment, integrated into objects, or worn on the body. The sensor data streams deep dive looks at the challenges in sustaining these sensor networks, aggregation of raw data, tagging of meta-data and challenges in data storage, security, retrieval and analysis. The talks and discussions of the day are divided into three strands: organizing and managing streams, sharing and analyzing streams, and privacy and security issues. Dive Coordinators: Dane Skow, Marc Langheinrich, Rajesh Sankaran

0830-1000 Organization and Management

This thread introduces and discusses the challenges in sustaining a hybrid sensing and actuation network of wired and wireless devices. The complexities due to the heterogeneity in types of sensing and actuation devices and platforms, their implications on the modes of data aggregation, communication protocol and technology requirements, layered addition of meta-data and marshaling of data for storage and dispersion are likely to be the main topics of this session.

Keynote: Physical Coupled Object (PCO): A New Approach to Aggregate Physical Objects in Physical Spaces. (Michel Banatre, INRIA)

ShortTalk: Communications in heterogeneous sensing and actuating networks. (Rajesh Sankaran, LSU and Argonne)

ShortTalk: Web-based Smart Things Ecosystems. (Simon Mayer, ETH-Zurich)

ShortTalk: "Passive Wireless Integrated Sensing at UPRM" (Yi Jia, Univ. Puerto Rico, Mayaguez)

1030-1130 Sharing and Analysis

Following the network organization and management, this thread of discussions will focus on layered storage, retrieval and maintenance (pruning, compression etc.) of data. Timely sharing of the data with trusted and interested parties (Law enforcement, public policy makers, health-care sectors, etc.) in sufficient and meaningful detail towards achieving the desired goals will also be discussed in this session. Finally, data visualization and analysis tools to interpret and understand the enormous amounts of sensor data will be discussed.

Keynote: "Sharing Belongings with Your Significant Other(s) and Seeing What's Important" (Bob Evans, Google)

ShortTalk: "Timing is (almost) Everything" (Dane Skow, Argonne and U. Chicago)

ShortTalk: "Turning Data into Knowledge/Wisdom" (Marie Kim, ETRI)

ShortTalk: "Choreographies of Services and Things" (Nikolaus Georgantas, INRIA)

1130-1230 Privacy and Security

Offering privacy and security services at lower levels is a challenge as much of the data requirements stem from the actual application that uses the sensor data. Consequently, viable approaches will must be highly customizable while offering sufficient guarantees for attack resilience and/or data obfuscation. We discuss the limits of low-level protection approaches, and/or explore the interplay of such methods with specific applications and/or domains.

Keynote: TBA (Marc Langheinrich, USI)

ShortTalk: "Preserving Privacy in a Public World" (Charlie Catlett, Argonne and U. Chicago)

ShortTalk: " Cultural Variations on Privacy and Security" (Satoshi Sekiguchi, AIST Japan)

1230-1600 Lunch and afternoon open for small group informal discussions.

Afternoon Charge: (TBA)

1600-1800 Hands-On Lab

Thursday: Interactions and Autonomy

The notion of autonomous agents is core to a vision of how pervasive computing will function and interact with humans and their environment in the future. Biological entities are the basis for what we currently understand about purpose-driven, independent action. It's unclear however, if or how these ideas are applicable to built things. This last day will be devoted to this fundamental topic. Discussion leaders will offer some initial thoughts, pose the issues as they see them and lead the discussions. Workshop participants are asked to keep these topics in mind throughout the week. Dive Coordinators: Paul Domagala, Majd Sakr, Rick Stevens

0830-1000 Exploring the Nature of Autonomy

Discussion Leader: Rick Stevens, Argonne National Laboratory and The University of Chicago

1030-1130 The Genesis of Autonomy in Built Objects (Artificial Autonomy?)

Discussion Leader: TBD

1130-1230 Human Perception of Machine Autonomy

Discussion Leader: Majd Sakr, Carnegie Mellon University - Qatar

1230-1600 Lunch and afternoon open for small group informal discussions.

Afternoon Charge: (TBA)

1600-1800 Hands-On Lab

Friday: Wrapping up Loose Ends and Writing

Fluid breakouts to draft white paper summarizing the week and highlighting insights.

0900-0930 Outlining the Report, discussion of audience and intent

0930-1030 Breakouts to Outline Sections and Agree on Writing Assignments

1030-1600 Writing w/ breaks

1600-1800 Hands-On Lab Wrap-Up (optional)

1800 Dinner Banquet and Awards

Saturday: What I Learned This Week

Short Presentations by each deep dive team.

0900-0915 Our Big Picture

0915-1015 Deep Dive Reports (15min each)

1015-1030 Closing Remarks and Next Steps

Adjourn at 10:30am