IN4MATX 241: Ubiquitous Computing

CLASS 5:

HUMAN BEHAVIOR AND CONTEXT SENSING

EUNKYUNG JO

Understanding and Using context (2001)

Personal and Ubiquitous Computing publishes peer-reviewed multidisciplinary research on personal and ubiquitous technologies and services. The journal provides a global perspective on new developments in research in areas including user experience for advanced digital technologies, the Internet of Things, big data, social technologies and mobile and wearable devices.

At the intersection of Human-Computer Interaction and Ubiquitous Computing

https://www.springer.com/journal/779

Understanding and Using context (2001)

Anind K. Dey

Professor and Dean of the iSchool, University of Washington

Ph.D. in Computer Science, Georgia Tech

(Advised by Gregory Abowd)

Renowned for his early work in context-aware computing

https://ischool.uw.edu/people/faculty/profile/anind

Understanding and Using context (2001)

Motivating work

Schilit B, Theimer M. Disseminating active map information to mobile hosts. IEEE Network 1994; 8: 22–32

“Define context as location, identities of nearby people and objects, and changes to those objects.”

Schilit B, Adams N, Want R. Context-aware computing applications. In: First International Workshop on Mobile Computing Systems and Applications, 1994; 85–90

“The important aspects of context are: where you are, who you are with, and what resources are nearby.”

The authors point out that ***the definition is too specific*** to determine whether a type of information not listed in the definition is context or not.

Understanding and Using context (2001)

Future research

Location-aware computing, Mobile computing, Ubiquitous computing,

Internet of Things

Cited for around 7,000 times

https://scholar.google.com/scholar?start=0&hl=en&as_sdt=0,5&sciodt=0,5&cites=7403972029488068108&scipsc=

What we talk about and when we talk about context (2004)

Published in the same journal: Personal and Ubiquitous Computing

At the intersection of Human-Computer Interaction and Ubiquitous Computing

https://www.springer.com/journal/779

What we talk about and when we talk about context (2004)

Paul Dourish

Chancellor's Professor of Informatics, University of California, Irvine

Ph.D. in Computer Science, University College, London

Combines technical research with sociology, anthropology, and cultural studies

http://www.dourish.com/research.html

What we talk about and when we talk about context (2004)

Motivating work

Dey A, Abowd G and Salber D (2001) A conceptual framework and a toolkit for supporting the rapid prototyping of context aware applications. Hum-Comp Interact 16(2.4):97.166

Context-aware computing

Weiser M (1991) The computer for the 21st century. Scientific American 265(3):94–104

Ubiquitous computing

Dourish P (2001) Where the action Is: the foundations of embodied interaction. MIT Press, Cambridge, MA

Embodied interaction

What we talk about and when we talk about context (2004)

Future research

Context-aware computing, Ubiquitous computing, Activity theory in HCI

Cited for around 2,000 times

https://scholar.google.com/scholar?oi=bibs&hl=en&cites=9105573877966832 64

A multi-sensor approach to automatically recognize breaks and work activities (2020)

Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)

“A premier journal series for research relevant to the post-PC era.”

IMWUT covers a broad range of topics such as mobile systems, wearable technologies and intelligent environments.

The scope includes research contributions in systems and infrastructures, new hardware and sensing techniques, and studies of user experiences and societal impact.

https://dl.acm.org/journal/imwut

A multi-sensor approach to automatically recognize breaks and work activities (2020)

The authors' research focus on wireless sensors, networking, and mobile sensing.

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https://search.usi.ch/en/people/ed68874515d21c1b690a8d4a158358ba/santini-silvia

https://www.inf.usi.ch/phd/dilascio/#research

A multi-sensor approach to automatically recognize breaks and work activities (2020)

Motivating work

Automatic detection of work activities (Avrahami et al., 2018; Oliver et al., 2004)

and breaks through multi-modal approach (Meyer et al., 2017; Tseng et al., 2019; Chawla et al., 2002; Grover et al., 2020; Kaur et al., 2020; Kimani et al., 2019)

Discussion

Discussion themes

Positivist approach vs. Phenomenological approach

(Colby, Arthur, Lika, Myles, Dennis)

Context is independent of activity and can be captured and modeled objectively.

vs

Context is defined dynamically in the course of users' interactions based on mutual understandings.

Which approach do you prefer? Why do you think it is more useful for designing systems?

Discussion themes

Current state of context-aware computing

(Myles, Colby, Lika, Jason, Neeraj)

How close is modern technology to Dey's or Dourish's visions of context-aware computing? What are some examples?

Are Dey's and Dourish's visions realistic?

Discussion themes

Is context-aware computing always beneficial for users?

Ex. Companies can use a context-aware system to surveil their employees, invading the employees' privacy (Lasicso et al., 2020).

What are some ethical challenges in context-aware computing?