Mental Health

A driving application for 4th Generation Computing

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UBICOMP 2016 MENTAL HEALTH WORKSHOP
TUESDAY 13 SEPTEMBER 2016
Outline

• A brief history of interactive technology (1936-2003)
• Beyond Weiser’s Ubicomp: Acknowledging a 4th generation of Collective Computing
• Driving applications for Collective Computing and the role of mental health
  • With an editorial position on interdisciplinary research and balancing agendas
A brief history of computing
1936 - 2003

New computing technologies create new perceptions of the human-computer relationship
Framing historical trends

<table>
<thead>
<tr>
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First, there was Turing and mainframe computing

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Alan Turing
Then, there was Kay and personal computing

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Alan Kay
Next up, Weiser with (mobile and) ubiquitous computing

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| 3          | Late 80’s    | 1 – Many               | Inch Foot Yard       | Initial: inch: Calendar/contact mgt, Human-human comms  
Follow-on: location services, social media, app ecosystem, education, advertising |

“The most profound technologies are those that disappear.”
Beyond Weiser’s Ubicomp: Acknowledging a 4th generation of Collective Computing

A “logical” continuation…

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This is not a “vision”. It’s a reality. Let me demonstrate…
Generation 4 Application: Personal navigation
Generation 4 Application: Personal navigation
What technologies have made this possible?
Generation 4 Technologies
The “cloud”
Generation 4 Technologies
The “crowd”
Generation 4 Technologies
Internet of Things …

The “cloud”

The “crowd”
Generation 4 Technologies

... + Wearables = ...

FROM HEAD TO TOE WEARABLE TECHNOLOGY

GLASSES
Overlay navigation directions and information about points of interest directly on to the wearer's field of vision.

SHIRT
Conductive thread means a computer is literally built into the fabric of the shirt. Providing the processing power for all of the other wearable gadgets.

WRISTWATCH
Monitor when a message arrives and displayed on the watch face. Tells the time too.

WRISTSTRAP
A sensor that tracks movement to determine the number of steps taken through the day – 10,000 is ideal – and how much sleep the wearer gets each night.
Generation 4 Technologies

... the “shroud”
Generation 4: Application Theme

Collective Computing

Using the cloud to merge data from the shroud with intelligence from the crowd rapidly empowers the individual with specialized expertise beyond her training.

The individual can harness on-demand expertise.

Be Your Own \{tour guide, health advisor, teacher, \ldots\} (BYO{\{x\}})
# Generation 4: Collective Computing

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*Follow-on*: location services, social media, app ecosystem, education, advertising |
| 4          | Mid 00’s     | Many — Many            | Cloud Crowd Shroud   | *Initial*: Personal navigation and entertainment  
*Follow-on*: 2015-2025 examples of BYO{x} |

Finally, Abowd gets to the point for this workshop!
Driving applications for Collective Computing and the role of mental health

Be Your Own Counselor
A Campus Catch 22

Not all who need mental health counseling seek it out.

And if they did, the university would not be able to support them all.

This is a clear opportunity to help individuals help themselves.
4th Generation? YES!!!

Shroud:
- Collect active and passive data via on-body devices and interaction with environment through IoT-like services
- Provide actionable feedback to individual and campus

Cloud
- Aggregation of data for behavioral analysis (individual and cohorts)

Crowd
- Peer/Professional mentoring on-demand, Social network activity as proxy; Peer sensing
The CampusLife Consortium

Inspired by Dartmouth StudentLife efforts

An international cooperation to support a large-scale, multi-campus testbed for exploring mobile health

- Dartmouth, Cornell, CMU, Georgia Tech, UT Austin, Northwestern, Cambridge (*UCL, Michigan, Notre Dame, UC Irvine, Washington*)
- Others?

Combination of computing and health researchers, so I need to provide a warning here.
Balancing research agendas

- High mental health contribution
  - Health professionals care (but your colleagues won’t)
  - Everybody cares (what you write in a grant, but dangerous place to start)
- Low mental health contribution
  - Nobody cares (but someone likely makes money)
  - Technologists care (but a campus counsellor won’t)

High computing contribution

Low computing contribution
How committed are you?

If we execute on CampusLife Consortium well, we can likely serve all three.

- **High**
  - Engaged, but not driven by a tech solution
  - Engaged and convinced a novel technology is a key component
  - Motivated, but mostly concerned about a particular tech approach

- **Low**
  - Computing contribution
CL Consortium Goals

• Build a common and sustainable research platform (AWARE Framework) for data collection, analysis and reflection along with common research questions to lower barrier to entry in this space.

• Push toward large-scale (1000’s of users), long-term (years) deployments across institutions.

• Engage with the full range of stakeholders to produce a sustainable service for students and universities.
If you want to join...

Talk to Gregory, Andrew or Saeed

We have monthly conference calls on the first Tuesday of the month to coordinate efforts.
This is about more than (mental) health

From quantified self to the quantified community
Conclusions

Grand opportunity for Ubicomp:

*Inspired by the idea of BYO{x}*