Mental Health

A driving application for 4th Generation Computing

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UBICOMP 2016 MENTAL HEALTH WORKSHOP
TUESDAY 13 SEPTEMBER 2016

Georgia Tech School of Interactive Computing
College of Computing

Outline

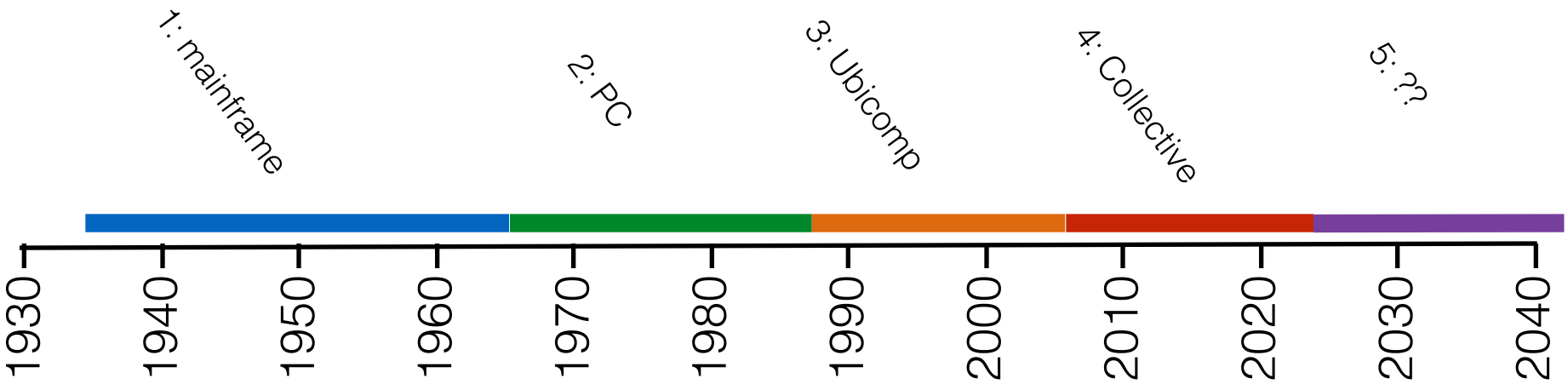
- A brief history of interactive technology (1936-2003)
- Beyond Weiser's Ubicomp: Acknowledging a 4th generation of Collective Computing
- Driving applications for Collective Computing and the role of mental health
  - With an editorial position on interdisciplinary research and balancing agendas

A brief history of computing

1936 - 2003

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

Framing historical trends



Generation	Vision began	People-to-Device ratio	Canonical technology	Applications
				Initial: *Follow-on*:

First, there was Turing and mainframe computing

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1	Mid '30's	Many – 1	Mainframe	*Initial*: Scientific calculation *Follow-on*: Data processing

Alan Turing

Then, there was Kay and personal computing

Generation	Vision began	People-to-Device ratio	Canonical technology	Applications
1	Mid 30's	Many – 1	Mainframe	*Initial*: Scientific calculation *Follow-on*: Data processing
2	Late 60's	1 — 1	PC	*Initial*: Spreadsheet *Follow-on*: database mgt, document processing

Alan Kay

Next up, Weiser with (mobile and) ubiquitous computing

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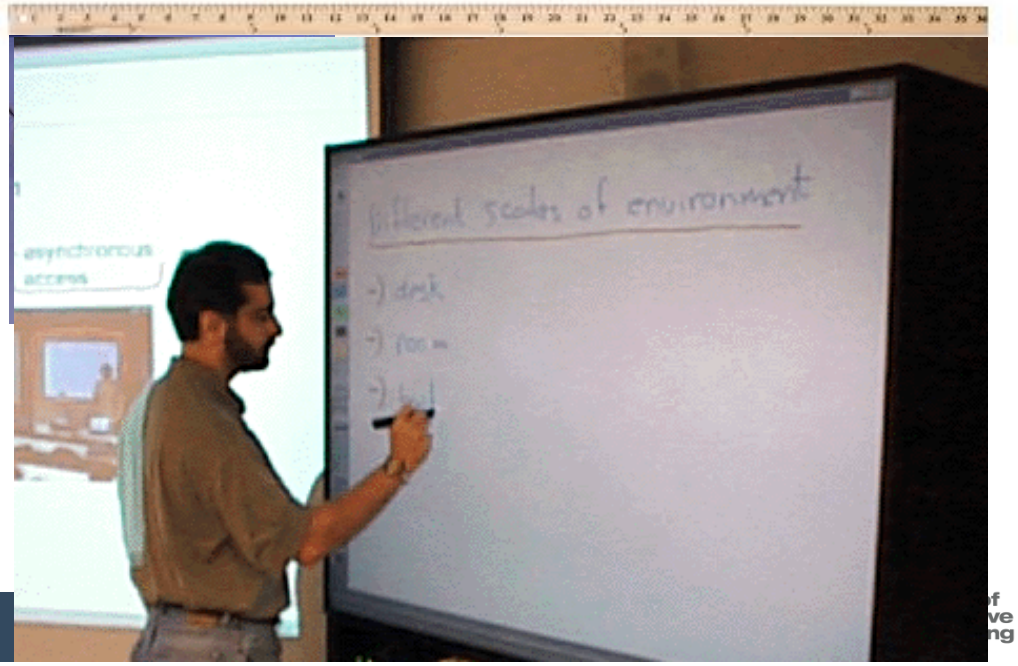
3	Late 80's	1 — Many	Inch Foot Yard	*Initial*: inch: Calendar/contact mgt, Human-human comms *Follow-on*: location services, social media, app ecosystem, education, advertising

The Computer for the 21st Century

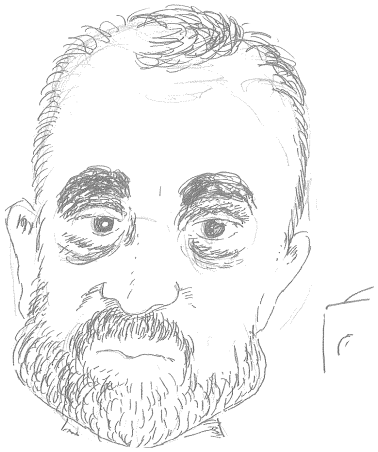
SCIENTIFIC AMERICAN *September 1991*

by Mark Weiser

"The most profound technologies are those that disappear."



Beyond Weiser's Ubicomp:
Acknowledging a 4th generation of Collective Computing



Abowd, Gregory D. "Beyond Weiser: From Ubiquitous to Collective Computing." *IEEE Computer* Vol. 49, No. 1 (January 2016): 17–23. doi:10.1109/MC.2016.22.

A “logical” continuation…

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4	Mid 2000’s	Many — Many	??	*Initial*: ?? *Follow-on*: ??

This is not a “vision”. It’s a reality. Let me demonstrate…

Generation 4 Application: Personal navigation

http://blog.furnishedquarters.com/wp-content/uploads/2014/12/iStock_000042077894Large.jpg

Generation 4 Application:
Personal navigation

http://blog.furnishedquarters.com/wp-content/uploads/2014/12/iStock_000042077894Large.jpg

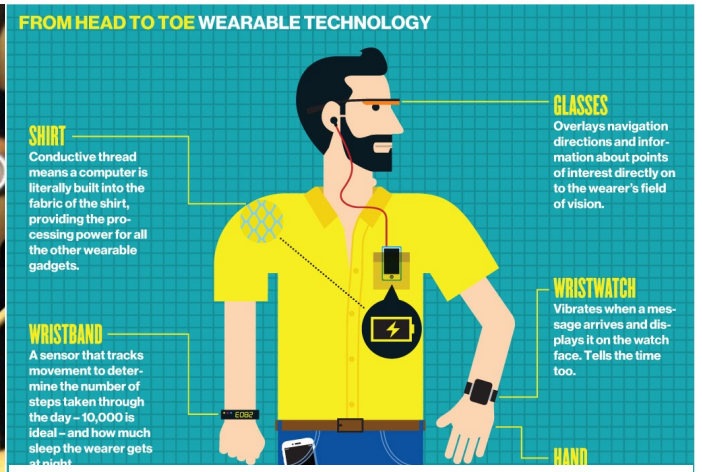
What technologies have made this possible?

Generation 4 Technologies
The “cloud”

Generation 4 Technologies
The “crowd”

Generation 4 Technologies
Internet of Things …

Generation 4 Technologies
… + Wearables = …



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, …} (BYO{x})*

Generation 4: Collective Computing

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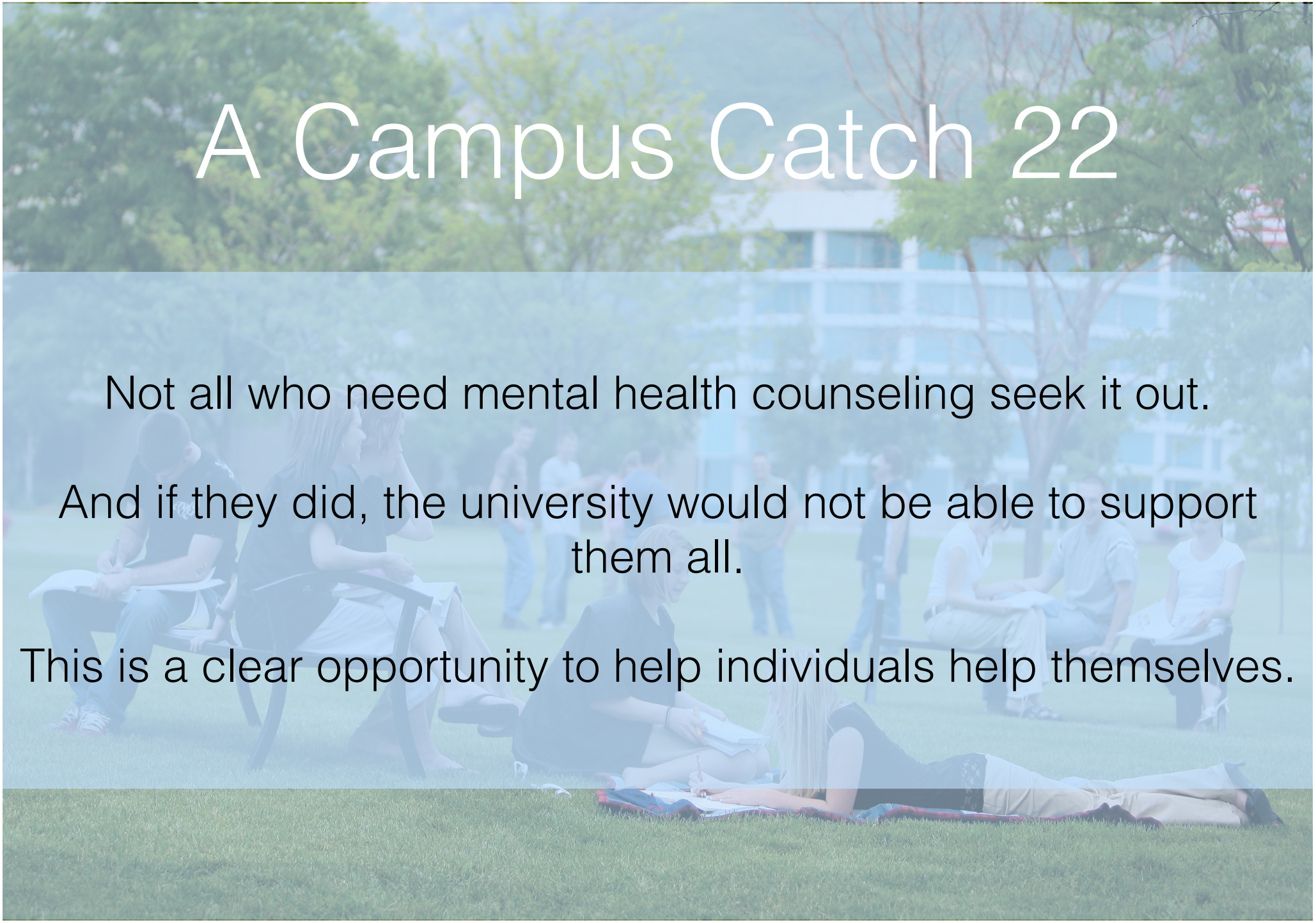
4	Mid 00's	Many — Many	Cloud Crowd Shroud	*Initial*: Personal navigation and entertainment *Follow-on*: 2015-2025 examples of BYO{x}

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

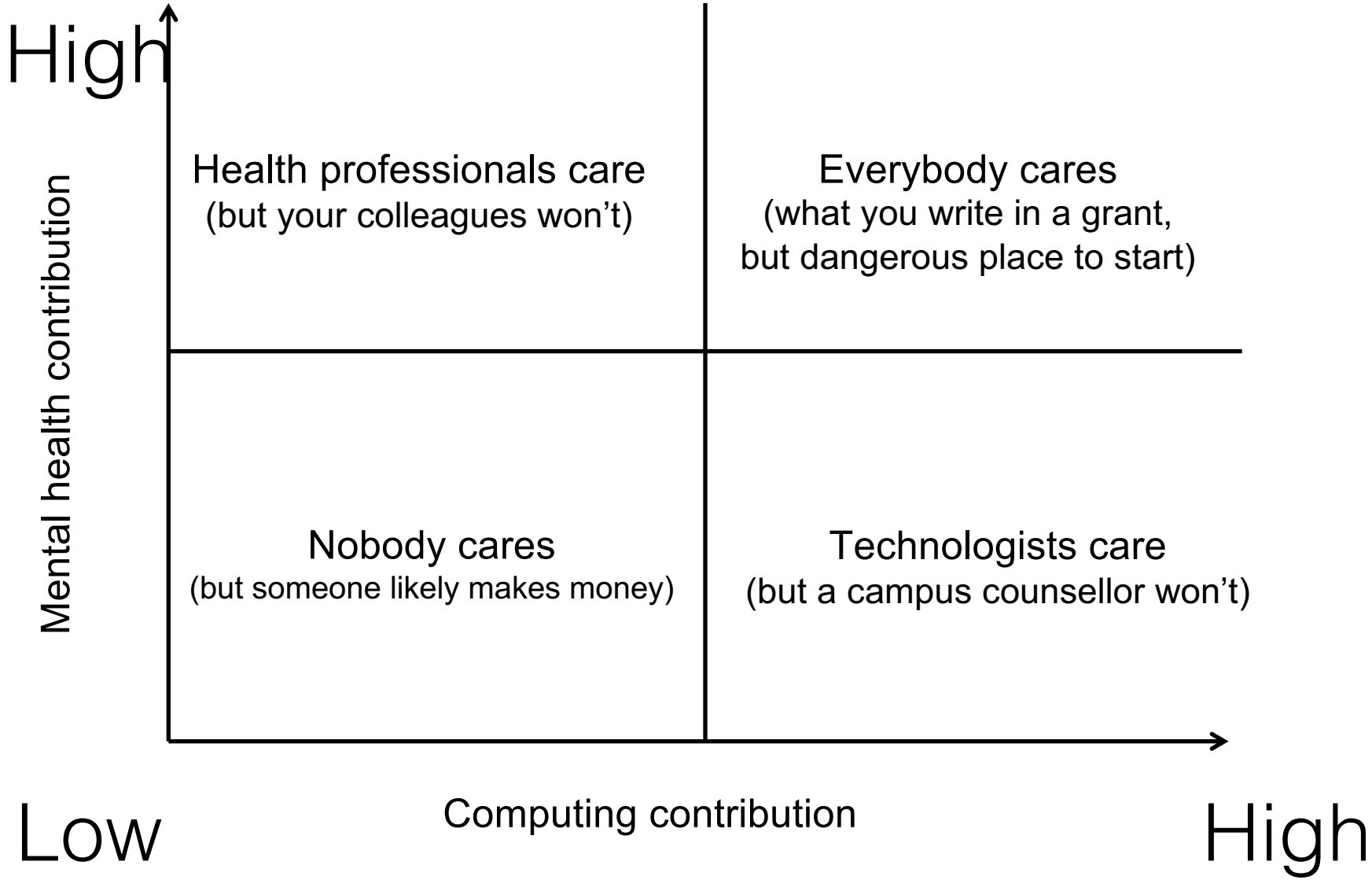
Inspired by Dartmouth StudentLife efforts

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?

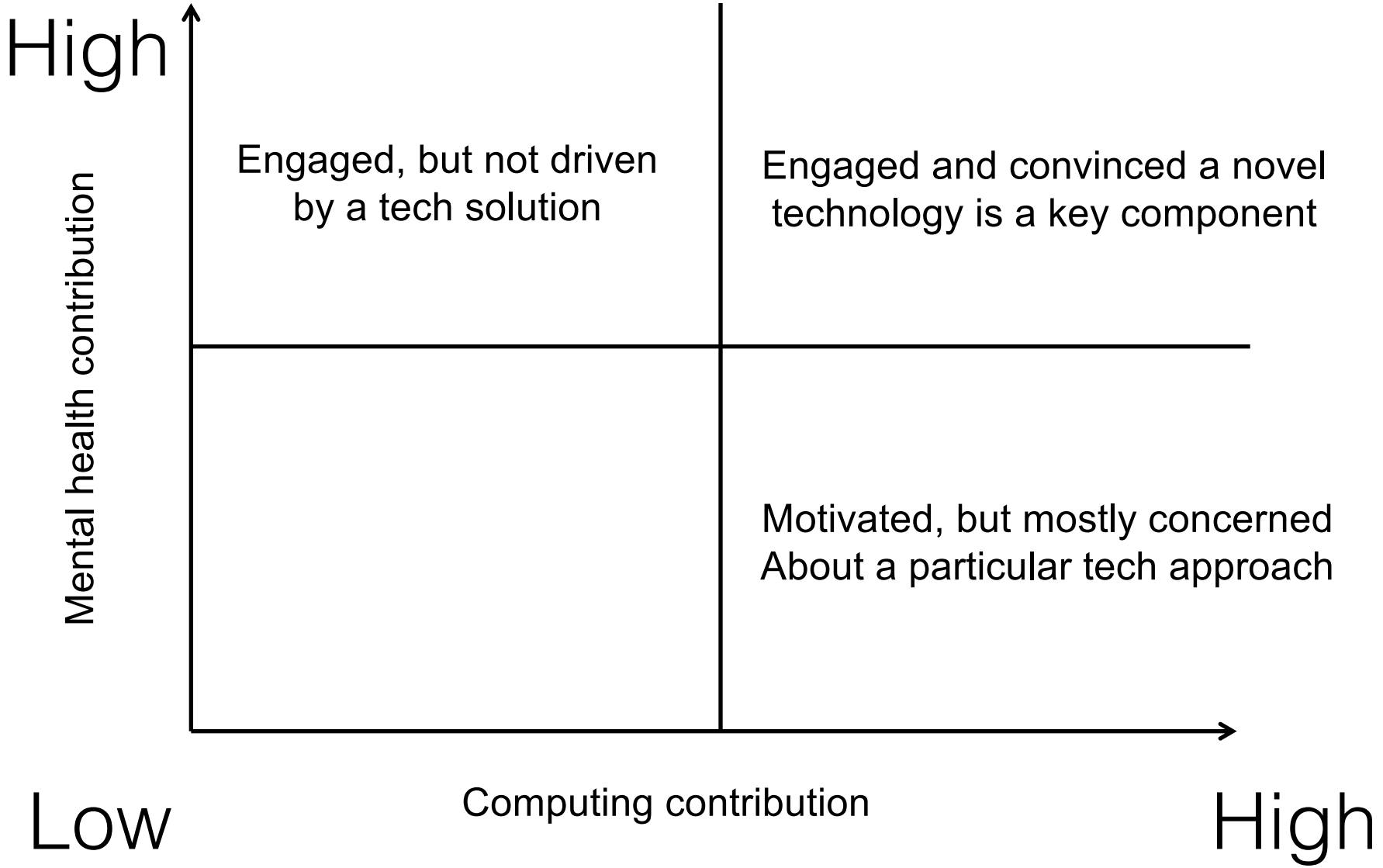
Combination of computing and health researchers, so I need to provide a warning here.

Balancing research agendas



How committed are you?

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



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…

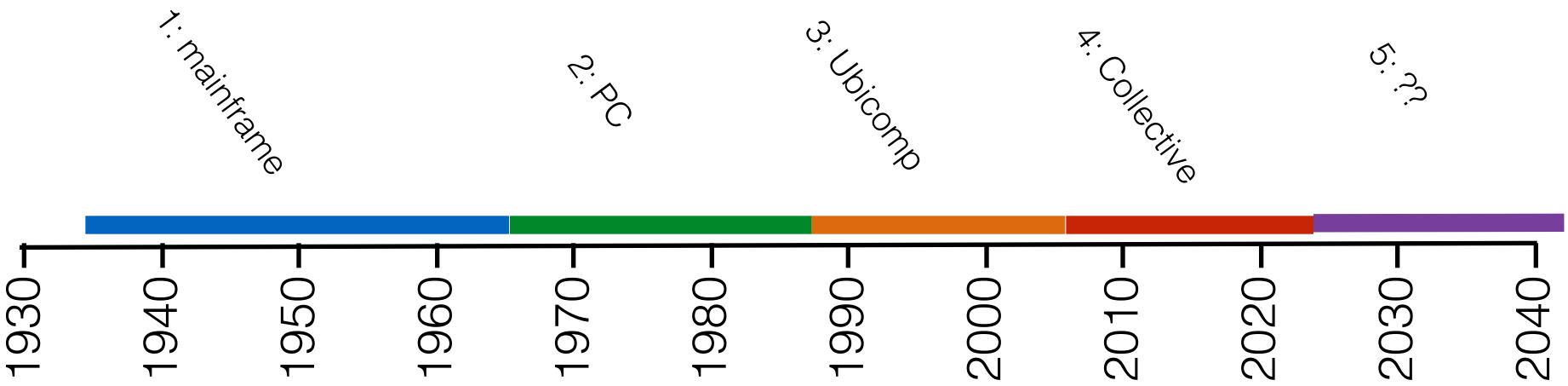
Talk to Gregory, Andrew or Saeed

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}