Ubiquitous Computing

COGS 230
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Goals

1. What *is* ubiquitous computing?

2. How has ubiquitous computing evolved in the past 15 years?

3. What research questions does ubiquitous computing present?

Bonus : What is the impact of ubiquitous computing on society?

Ubiquitous Computing

“invisible computing” … “drawing computers out of their electronic shells” (Weiser, 1999)

…”power of computation [is] seamlessly integrated into the objects and activities of daily life” (Dourish, 2001)

A Vision of the Future

Dourish, P. (2001). Getting in touch. In *Where the action is: The foundations of embodied Interaction* (pp. 25–53). MIT Press.

A vision of the future

//in progress → 3 main points

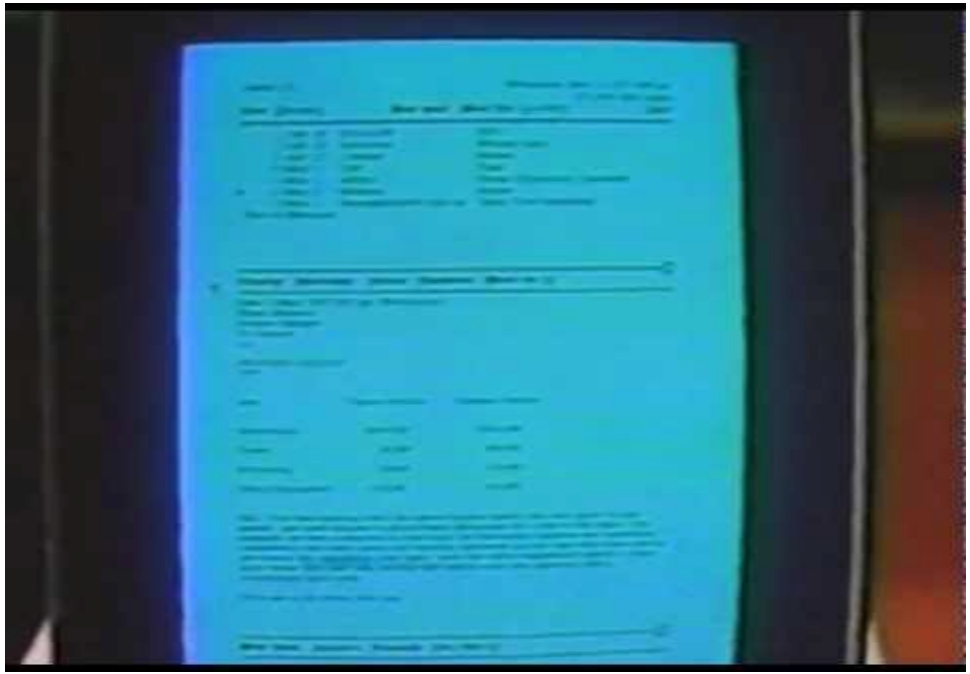
what has changed, and what has remained the same?

tangible computing → relationship between computers and the world in which they (and we) operate (27)

ubiquitous computing (28)

Personal Computer

Xerox PARC



Xerox Alto Workstation

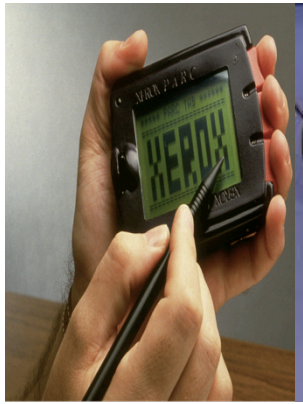
1970

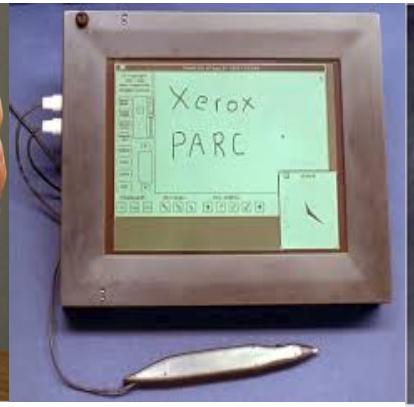
1980

“Computation by the inch, by the foot, by the yard”

Xerox PARC

Olivetti Research Centre, Cambridge





PARC Tab

PARC Pad

Liveboard

Active Badge

1980

1990

Activity

Create an inventory of all of the devices you have used that exemplify **ubiquitous computing**. Using the concepts provided, connect each device to the relevant “nodes” in the mind map. (5 minutes)

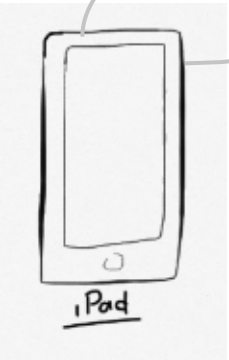
“personal computer”

“augmented reality”

“by the inch”

“by the foot”

“by the yard”



“tangible bits”

“virtual reality”

Discussion

Why might the personal/desktop computer ***not*** have seen substantial change over the years?

What are ***non-obvious*** ways that ubiquitous computing has become pervasive in our lives?

Skinput : An interactive canvas

Harrison D.Morris,D, C. T. (2011). Skinput:appropriating the skin as an interactive canvas. *Communications of the ACM*, *54*(8), 111–118. doi:10.1145/1978542

Main Discussion Points

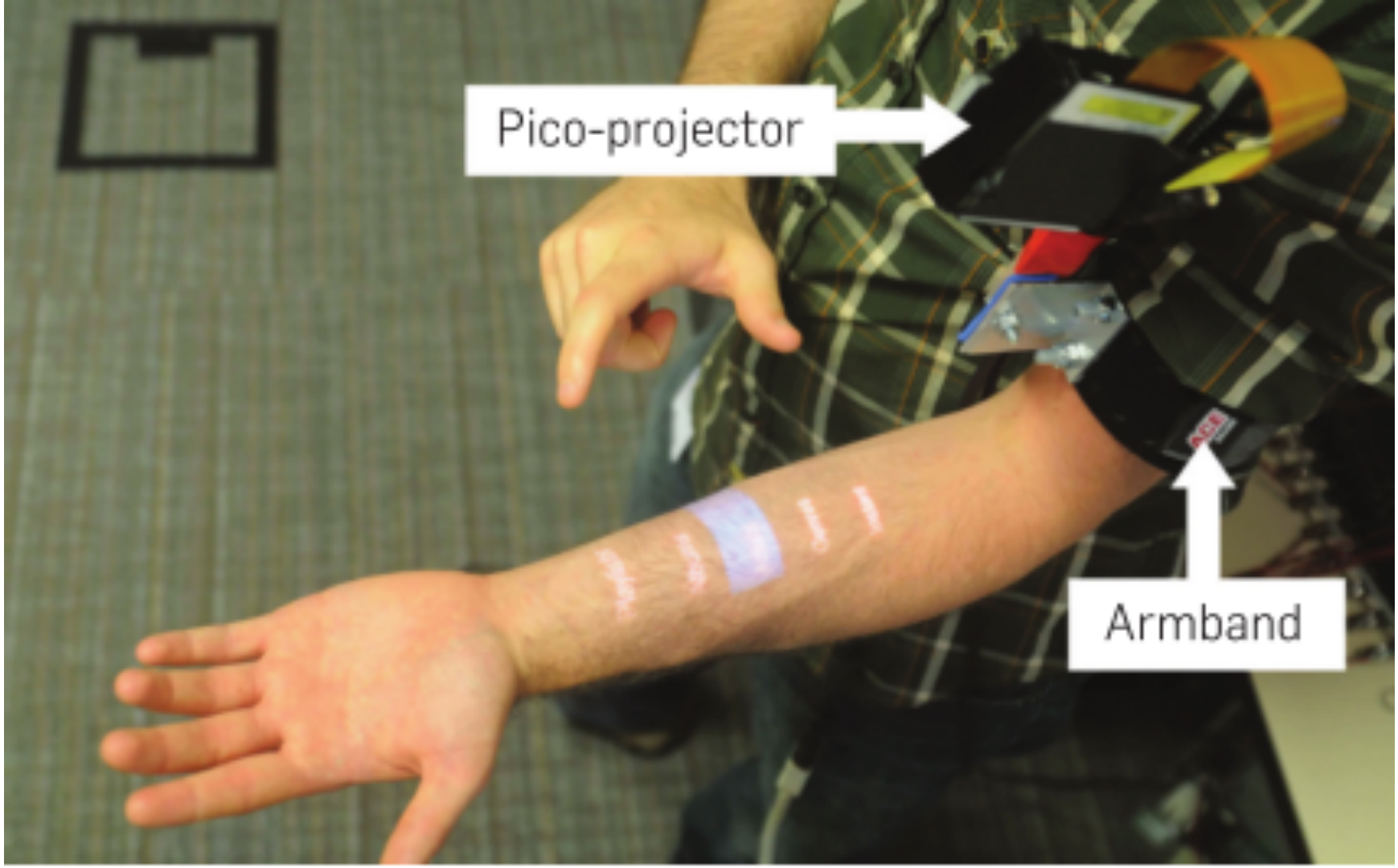
Skin as input device

Biosensing and how Skinput uses it

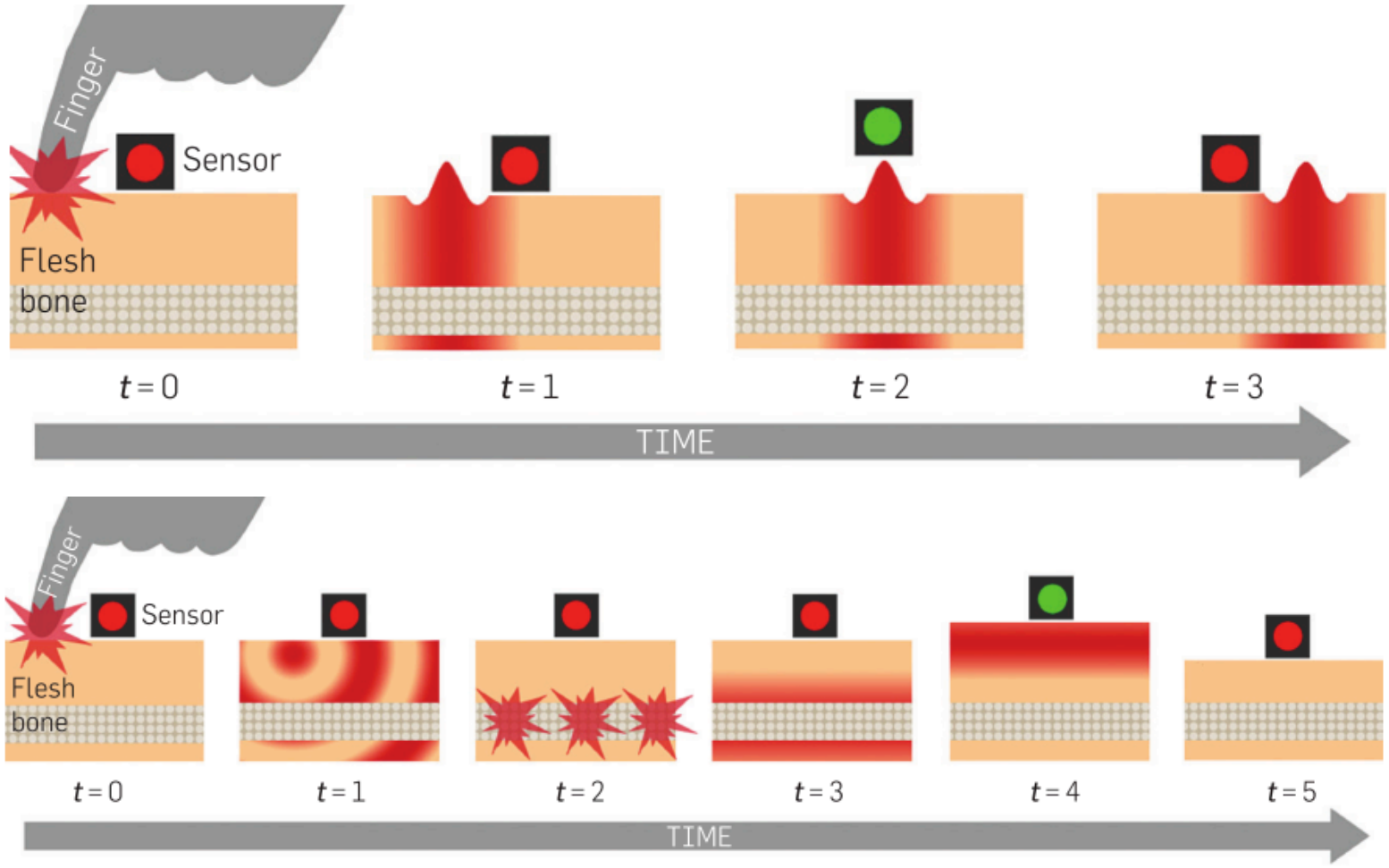
Applicability of Skinput and other biosensing devices

Susan Court
Chris Harrison

Skin as an input device


Pico-projector
Armband

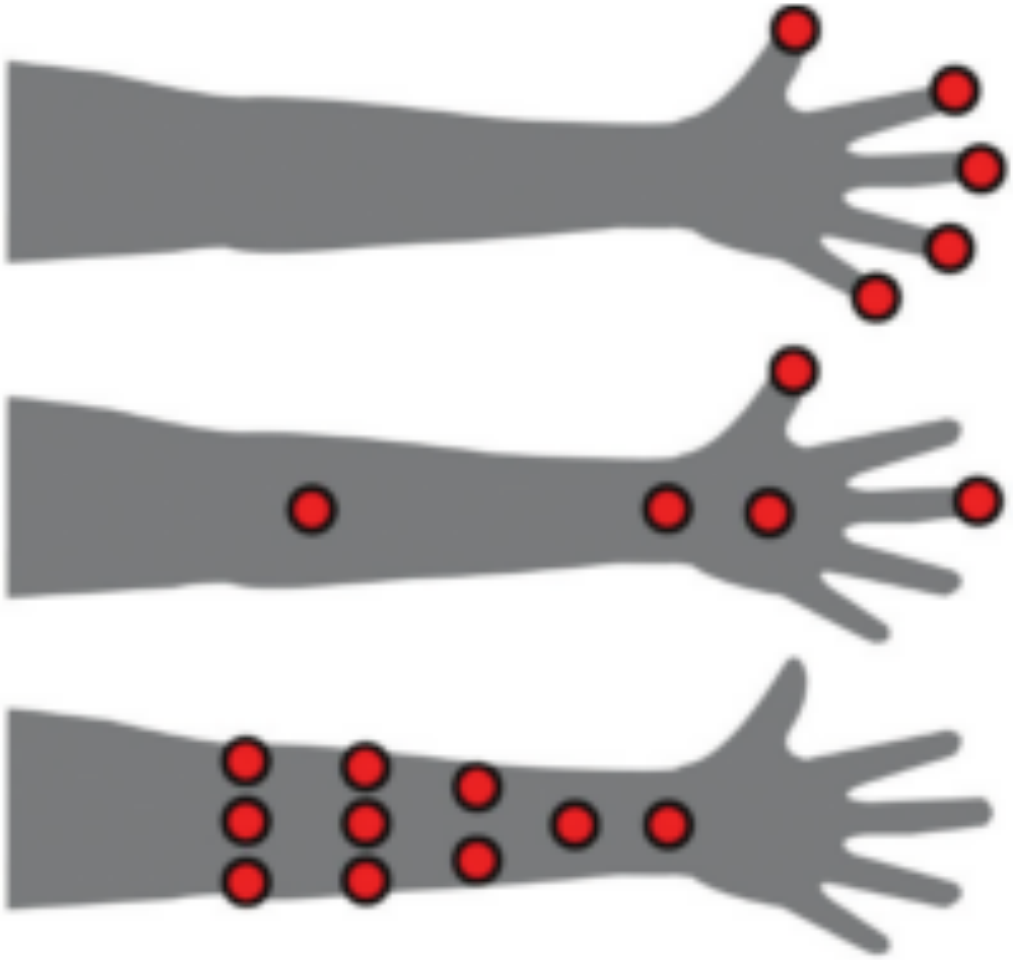
Biosensing & how Skinput uses it


Finger
Sensor
Flesh
bone
t = 0
t = 1
t = 2
t = 3
TIME
Finger
Sensor
Flesh
bone
t = 0
t = 1
t = 2
t = 3
t = 4
t = 5
TIME

Fingers
5 Locations

Whole Arm
5 Locations

Forearm
10 Locations



Discussion

In what ways do you think Skinput could be used?

<<Take some examples from student commentaries>>

What other products do you think could use this sort of biosensing?

What other products do you know of that use tactile contact as the source of input?

Activity

Pick a device from the previous exercise, and put yourself “in the shoes” of the product’s designers. What **research question** might you have asked ? Discuss how you might have designed a study to answer the question. (5 minutes)

Discussion

What is the impact of ubiquitous computing on society?

References

Xerox Alto Image https://de.wikipedia.org/wiki/Personal_Computer#/media/File:Xerox_Alto_mit_Rechner.JPG

Xerox Alto Video https://www.youtube.com/watch?v=M0zgj2p7Ww4#action=share

PARC Tab Image http://blogs.parc.com/blog/2010/09/its-time-to-reap-the-context-aware-harvest/

PARC Pad Image http://blogs.parc.com/blog/2010/09/its-time-to-reap-the-context-aware-harvest/

Olivetti Active Badge Image https://viallyhardi.wordpress.com/2010/05/12/ubiquitous-computing/

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