

Wearable Computing or Beating the House!

Ian Anderson

The University of the West of England

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Outline

1

Background

- Definition
- History

2

CA

- Context Awareness
- Inferring Context

3

2006

- State of the Art

4

Summary

- Conclusions

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Areas

Different Spaces, Applications and Users

- Desktop Computing - Big fancy GUI's.
- Mobile Computing - BitTorrent from the beach.
- Pervasive/Ubiquitous Computing - Where is my computer?
- **Wearable Computing - Today's talk.**
- Implantable Computing - Brain chips anyone?



The Wearable PC

What is a wearable?

Many Definitions

- A person's computer should be worn, much as eyeglasses or clothing are worn, and interact with the user based on the context of the situation [MIT].
- A wearable computer is a computer that is subsumed into the personal space of the user, controlled by the user, and has both operational and interactional constancy, i.e. is always on and always accessible [Steve Mann, 1998].
- ...

Or simply...

A device that is mounted on the body!

Aims

A Wearable will enable...

- Computing on the go - and no this is not the same as mobile computing!
- Compliment and not interfere with everyday tasks.
- Something you previously could not do!

Example

- Monitor your seating posture.

Meeting these aims requires...

Major rethink!

- Displays - Are they needed?
- Inputs - Via a keyboard?

Example



Meeting these aims requires...

Example



Building a Wearable

Required Skills

- Artists - Crazy ideas.
- Hardware Developers.
- Software Developers.
- HCI - How will people use it.
- **I.e. Not one person!**

Hardware/Software Factors

- Power requirements.
- Memory, CPU.
- Network communication.
- Code will not be VB.

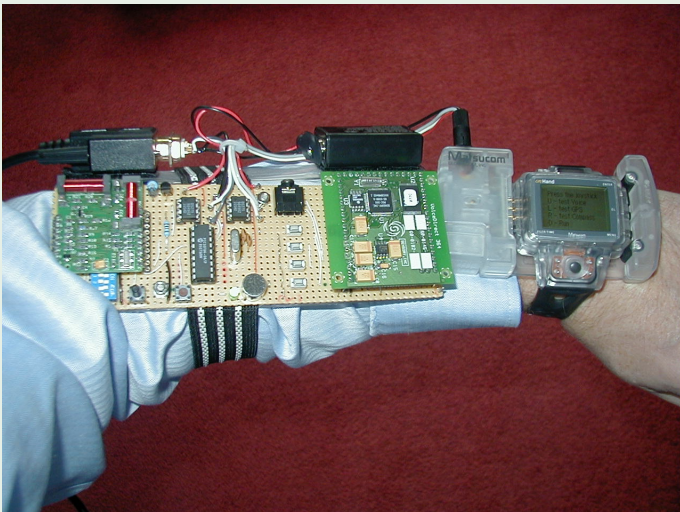
1961 - Successfully tested in Las Vegas



Never actually used though!

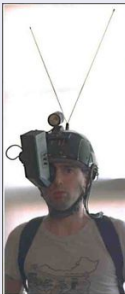
Find a Pub!

Example



Evolution

Steve Mann's WearComp wearable computer



(a)
1980



(b)
Mid 1980s



(c)
Early 1990s



(d)
Mid 1990s



(e)
Late 1990s

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Context Awareness

The well mannered computer will...

... understand the current situation it is being used in and adapt its behaviour accordingly.

Aspects of Context

- Location - Where you are?
- Time - Is it the evening?
- Activity - What are you currently doing?
- Company - Who are you with?
- Weather - Is it raining?
- Emotions - Are you happy?
- ...

Current Context

Positioning Techniques

- GPS
- Ultrasonic
- Beacon based
- Location fingerprinting
- ...

Activity Recognition

Accelerometer.

Emotions

MIT - Voice analyser - Very hard to do well.

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What can I buy?

BioShirt



Monitor temperature and heart rate of athletes

What can I buy?

Head Mounted Display



Claim - “30-inch virtual theater-like image with clear and exquisite pictures”

What can I buy?

iSoundCap



iPod Cap - Destined for failure!

What can I buy?

Army



“includes weapon-mounted sensors, voice communications, GPS, a full-color visual interface via the monocular, and a long-range gun sight on the monocular as well”

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Summary

Wearable Computing

- Unobtrusive.
- Context Aware.
- Body mounted.

Slides will be...

<http://www.ianswebpage.com/uwe/>

Next Talk...

Activity recognition without an accelerometer.

Summary

Thank you