

Sentient Computing meets Social Networking

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Sentient Computing

“Sentient computing is the proposition that applications can be made more responsive and useful by observing and reacting to the physical world. It is particularly attractive in a world of mobile users and ubiquitous computers.”

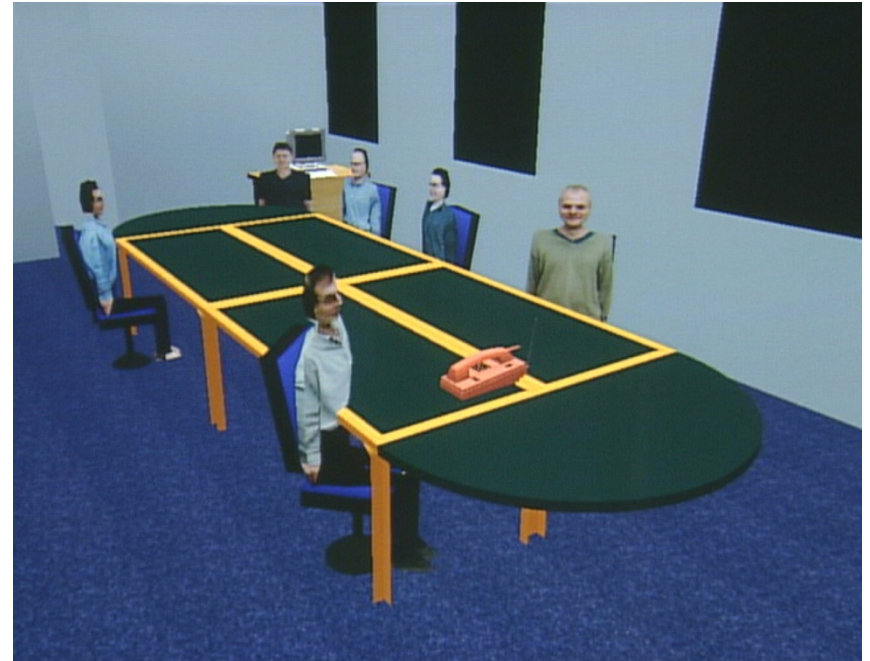
Andy Hopper, Royal Society Clifford Patterson Lecture, 1999

Shared Perceptions

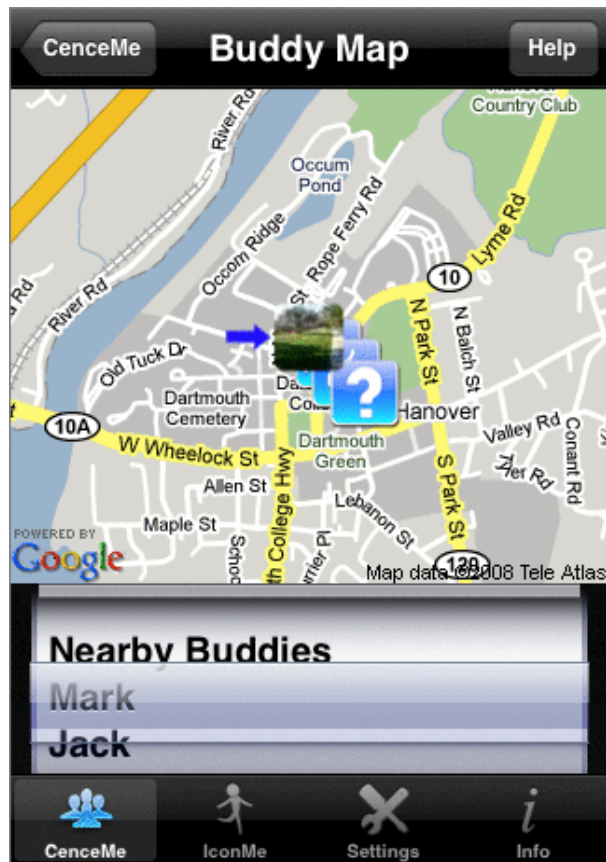
The world as seen by users



The world as seen by the sentient computing system



Mobile Location Aware Social Networking

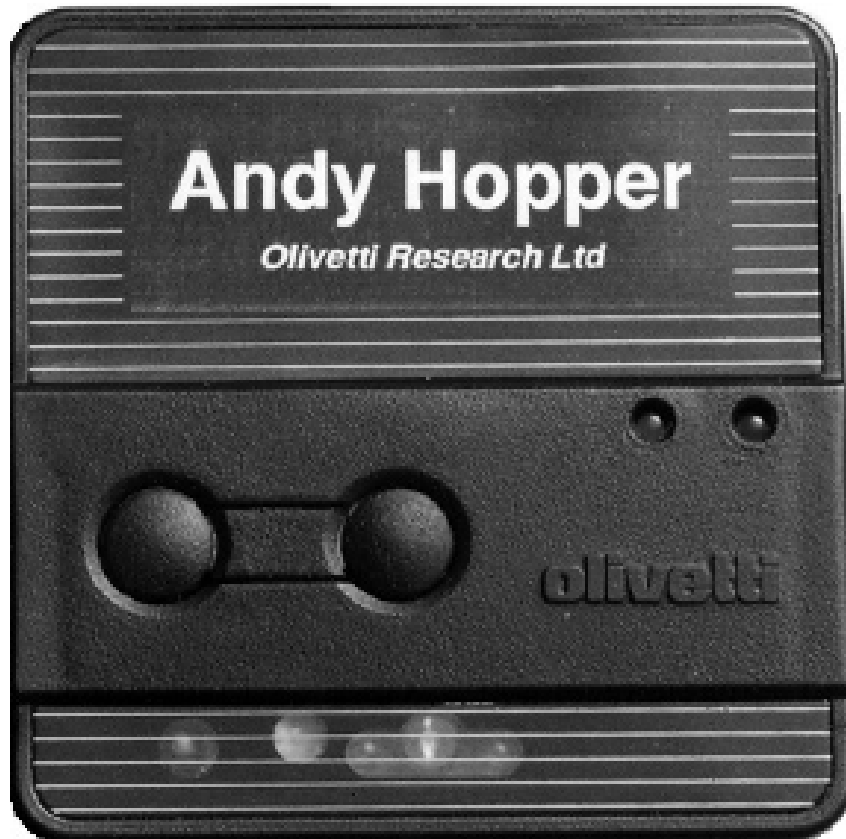


Ubiquitous Sensing



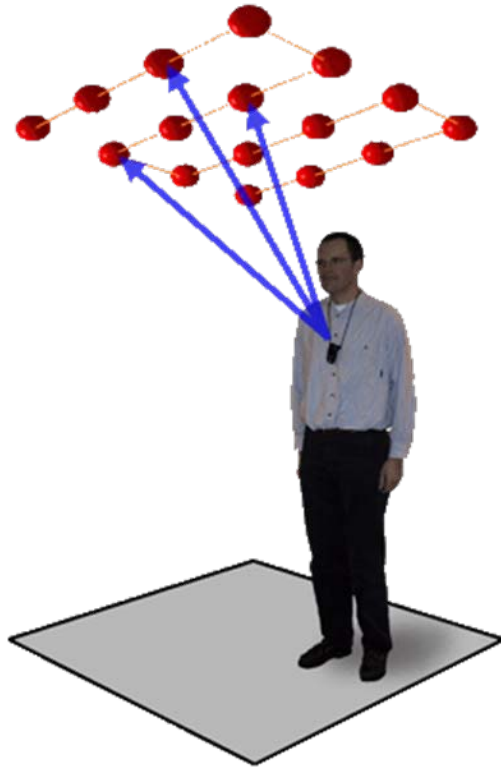
- GSM/3G
- WiFi
- Bluetooth
- Camera
- Accelerometers
- Speaker/microphone

The Active Badge System (1989-92)



- infrared-based
- badges emitted IR signals
- receivers placed in strategic locations
- room-level granularity

The Bat System



Sentient Computing Applications

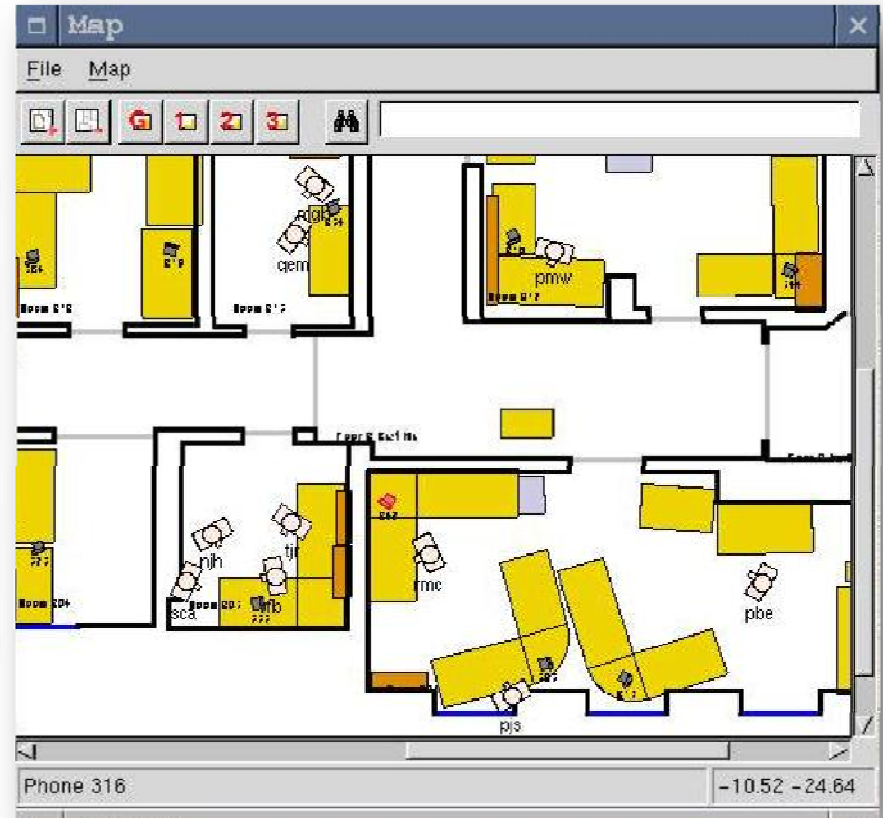
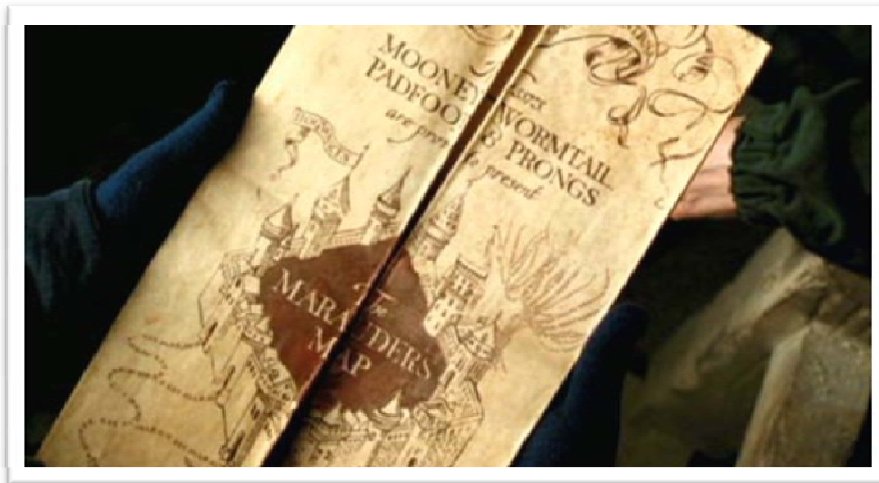
“Any sufficiently advanced technology is indistinguishable from magic.”

Arthur C. Clarke

Whereabouts Clock



Marauder's Map



Enhanced Interfaces



Status Updates

ssh
Tue Mar 26 14:32:24 1996

Olivetti Research - Personnel

P. Andros	218	#####	R207 Lab, north (L106) [+2]
P. Atkinson	209	#####	R209 Reception [+1]
P. Bennett	316	#####	23 nms R204 (DCC) [+1]
T. Blackie	344	#####	R205 (DPP) [+2]
H. Blackmore		A	Floor 2 Hall Central
H. Brown	375	#####	R202 (FHB)
C. Clarke	316	#####	R204 (L107) [+1]
I. Crowe	17	nms	Floor 3 near lift
P. Fordham	47	nms	Car park exit
G. Galloway	219	#####	R200 (FHB)
G. Girling	327	#####	R205 (DCC)
J. Gilbert		15:46	Car park exit
G. Grant		YES!	Car park exit
A. Harter	333	#####	R203 (DCC)
A. Hopper	424	#####	R207 (L10)
A. Jones	244	#####	R202 (DPP) [+2]
S. Lu	257	#####	R204 (DCC) Room [+1]
L. Luff	393	#####	R209 (DIL/SMP) [+1]
C. Page	51223	249469	Cable room/switch
C. Mason	320	13	nms R209 (DIL/SMP) [+1]
L. Milway		32:28	Ground floor near exit
S. Pluck			1st floor, back Fr L105
C. Porter	255	#####	R202 (DPP) [+2]
T. Richardson	201	#####	R204 (DCC) Room [+1]
C. Roberts	217	#####	R207 Lab, north (L106) [+2]
C. Scollin	206	YES!	R208 (DCC) (FHB/SMP/DCC)
C. Scully-P	305	A	R206 Reception room
F. Scaddan	400	#####	R204 (FHB) [+2]
P. Scoggins	400	#####	R204 (FHB) [+2]
H. Syfrig	400	#####	21 nms R204 (FHB) [+2]
C. Thompson	217	A	R207 Lab, bench 3 [+2]
H. Walker			In Bldg in this week
H. Wilkes	300	12:53	R206 (FHB)
K. Wood			Outside (H105)

Olivetti Research - Visitors

H. Bennett		04:5	Floor 2 near stairs
C. Cotton	316	Jan 31	Floor 2 near stairs
C. Fairbrother	305	A	R202 kitchen
G. Harding	209	#####	R209 Reception [+1]
C. Lohani		14:14	Car park exit
F. Minter		14:20	Car park exit
A. Mendenhall	210	10:58	R200 (FHB)

Computer Laboratory - Personnel

H. Kelly		9 nms	R202 (DCC)
C. Bacon		04:5 until	09/04/96
P. Brooks	334595	MEM	T25 (DCC)
G. Chang	32790		Reception corridor south
G. Green			In London All lines
G. Girling		10:31	Reception corridor south
F. Harding	334406	#####	T25 (DCC)
H. Johnson	334447	#####	T25 (FHB)
F. King		X	Lower 5 landing

ssh an kereda shen 26-03-96 14:29:40

Shrook

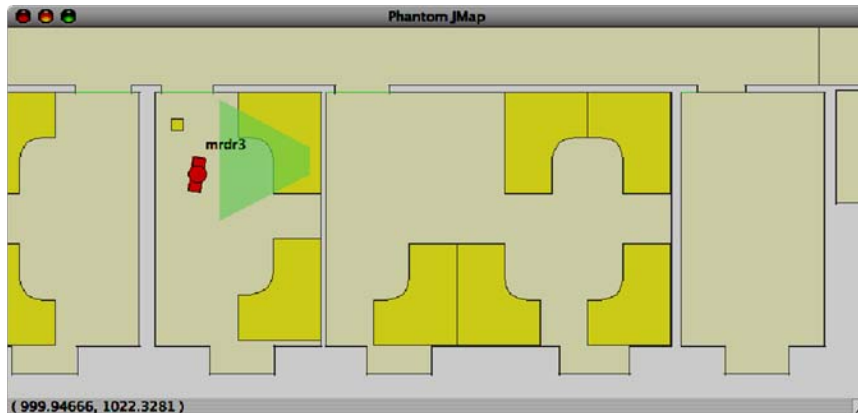
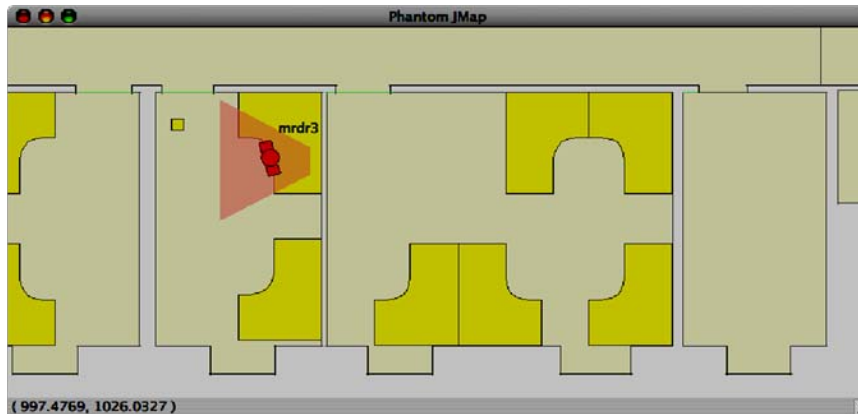
Channel: f Joseph Newman's Friends

Online

DatePublished	Item	Author
07:12	Helen Smith is waiting to measure grubby legs.	Helen Smith
01:10	Chris Jones is feeling the effects of a chilly bike ride and trip to the pub.	Chris Jones
00:03	Tom Craig is the one and only Dominator.	Tom Craig
Yesterday, 23:38	Angela Bennett is finally finished fixing ***3*** punctures on Dominic's...	Angela Bennett
Yesterday, 23:06	Simon Fothergill is worried, for a changel!	Simon Fothergill
Yesterday, 22:48	Bart Hallmark is glad to have finished floor tiling.	Bart Hallmark
Yesterday, 18:38	Hania Mochon is sick and tired.../.	Hania Mochon
Yesterday, 00:16	Erick Mendez is in japan.	Erick Mendez
Monday, 22:30	Rupert Beale is Mille Regretz de vous habandonner.	Rupert Beale
Monday, 22:29	Michal Mochon is back from Cologne...	Michal Mochon
Monday, 21:54	Pascal Ansell is phone-less for a while - left at babysitter house.	Pascal Ansell
Monday, 15:03	Gerhard Reitmayr is lost in translation.	Gerhard Reitmayr
Monday, 12:35	Phillip Turton is on schedule.	Phillip Turton
Sunday, 22:54	Philip Ansell is Pascal Ansell's Best Friend.	Philip Ansell
Sunday, 21:18	Una Buckley is all danced out.	Una Buckley
Sunday, 01:04	Emily Mitchell is relieved that there are no burglars in the house, despi...	Emily Mitchell

16 items

Context Awareness



- Context must be inferred from the raw sensor data available
- The inference of “Joseph is getting up from his computer” is **stateful**
- It required knowledge of the spatial containment before and after the event itself
- Instantaneous readings are not enough - we must store and utilise **history**

Context Awareness

The screenshot shows a web browser window displaying a Facebook profile for Joseph Newman. The browser's address bar shows the URL `http://cambridge.facebook.com/profile.php?id=36917061`. The page features a navigation bar with options like 'Profile', 'Friends', 'Networks', and 'Inbox'. On the left, there is a sidebar with a search bar and application links such as 'Developer', 'Photos', 'Groups', 'Events', and 'Marketplace'. The main content area displays a profile picture of Joseph Newman in winter gear, a status update 'is getting up from his computer.' with a timestamp of 'Updated 3 minutes ago', and a 'Mini-Feed' section. The Mini-Feed lists ten recent status updates, all of which are 'Joseph is sitting at his computer.' or 'Joseph is getting up from his computer.' with various timestamps. Below the Mini-Feed is an 'Information' section with an 'edit' link. The bottom of the page features a decorative penguin border.

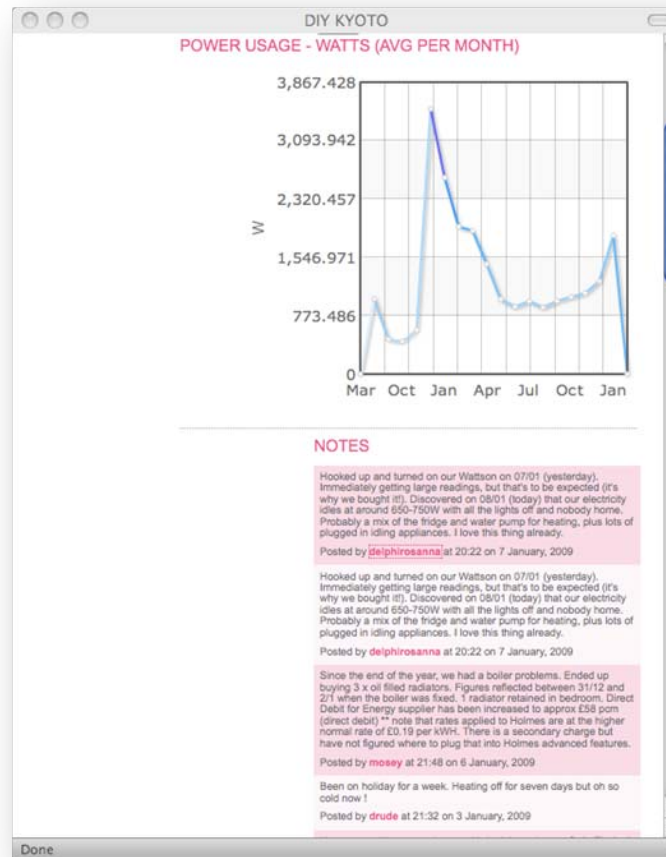
Issues for discussion

- Granularity to share; privacy concerns
 - City? Building? Room? 3 cm?
 - Only share inferences, not raw data?
- Representing presence
 - Text, 2D map, 3D environment, abstraction?

Sensor Communities: NIKE+

The screenshot shows the Nike+ World Runs website interface. At the top, there are navigation links for NIKE.COM, NIKESTORE.COM, PRODUCT DOWNLOADS, REGISTER, MY ACCOUNT, and NEWSLETTER. A central banner displays "51386 workouts logged in the last 24 hours" with buttons for LEADERBOARD and FIND OTHER RUNNERS. Below this, a "TOTAL KM LOGGED TO DATE" counter shows "00166927411". A map of Europe is visible with a tooltip that says "undefined, undefined NaN km". A navigation bar at the bottom includes "My Runs", "Challenges", "Community" (with a sub-counter of "166,927,409 km"), "Gear & Music", and "Support". The footer contains "COUNTRY SELECTOR", "STORE LOCATOR", "CUSTOMER SERVICE", "PRIVACY/TERMS OF USE", and "©2008 NIKE ALL RIGHTS RESERVED".

Sensor Communities: DIY KYOTO



Thank you!

Any questions?

Email: sjeh3@cam.ac.uk

More information:

<http://www.cl.cam.ac.uk/~sjeh3/social/>

<http://www.cl.cam.ac.uk/research/dtg>