



Aware & Interactive

Albrecht Schmidt

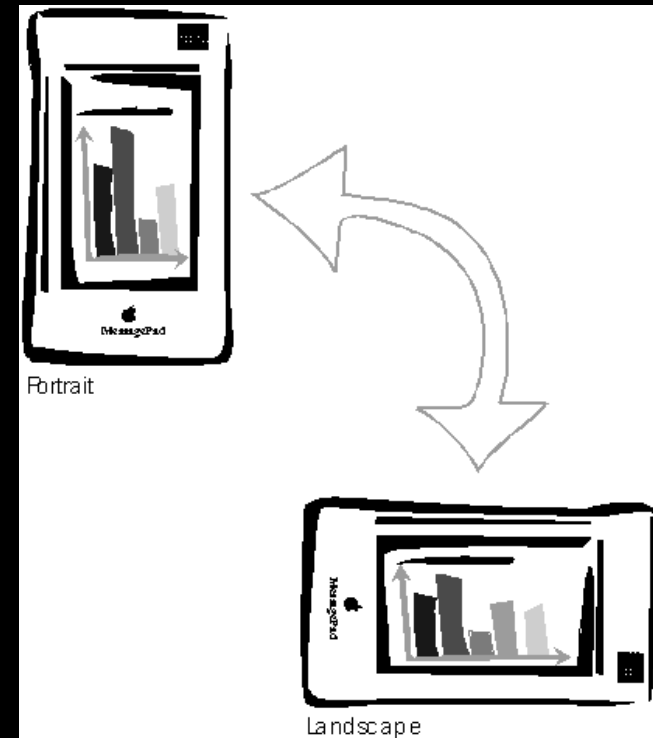
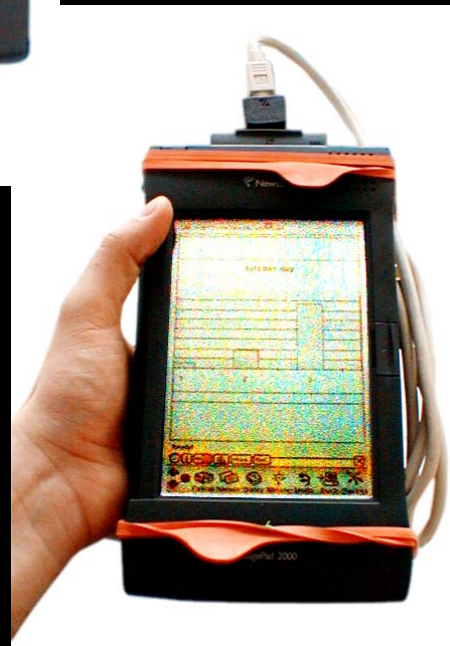
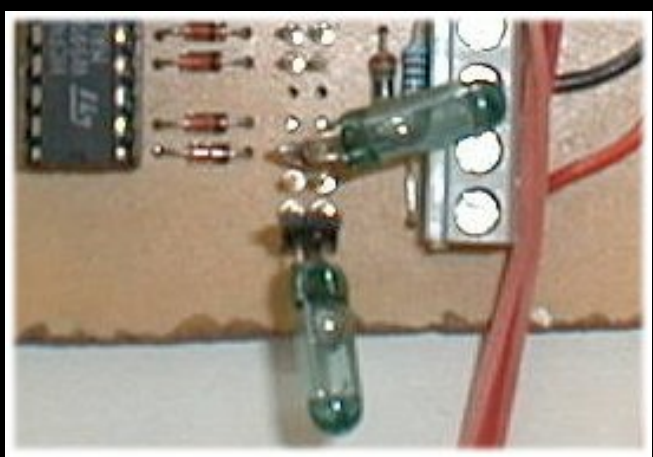
VIS, University of Stuttgart

Invited talks at FET11

Pervasive Socio-Technical Fabric

Self-Aware Novel Interaction Techniques on PDAs

Getting Physical – my initial experience (1998)



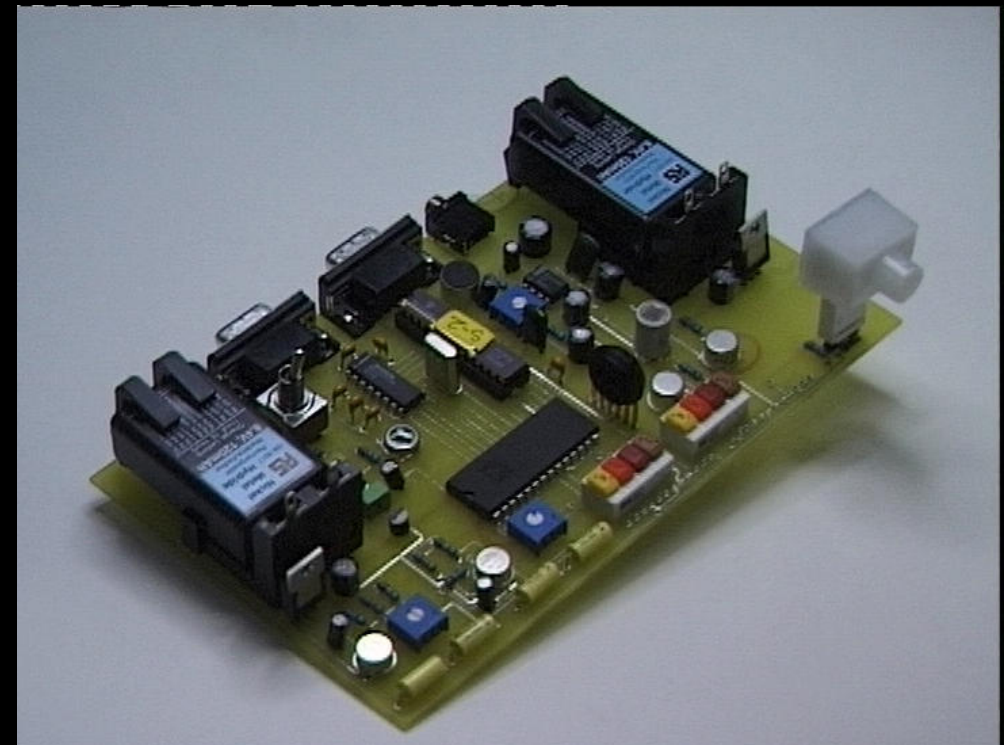
A. Schmidt, M. Beigl, and H.W. Gellersen,
There is more to context than location,
Computers & Graphics, vol. 23, no. 6, pp.
893-902, December 1999

Context-Aware Mobile Phones with sensors that that recognizes its context and enable implicit interaction (1999)

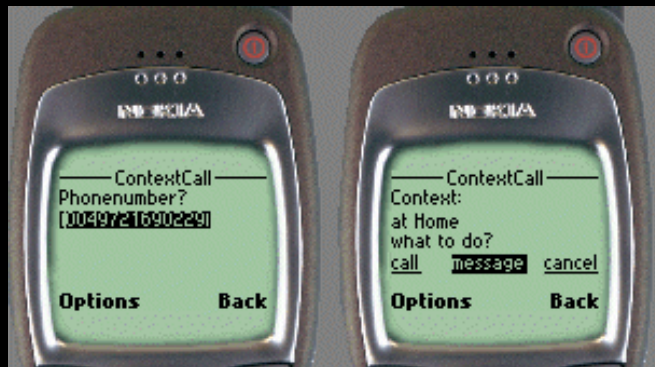


(Esprit "IT for Mobility" 26900)

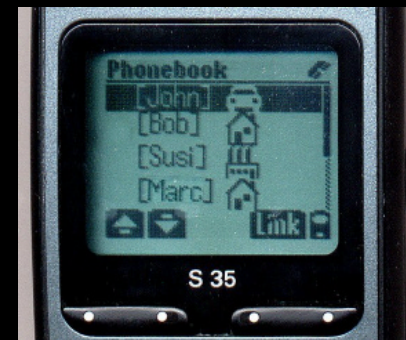
Schmidt, A., et al. 1999. Advanced Interaction in Context. In *Proceedings of the 1st int. Symposium on Handheld and Ubiquitous Computing* (September, 1999). LNCS, vol. 1707. Springer, 89-101.



Context-Call and Context Phonebook (Esprit "IT for Mobility" 26900 2000/2001)

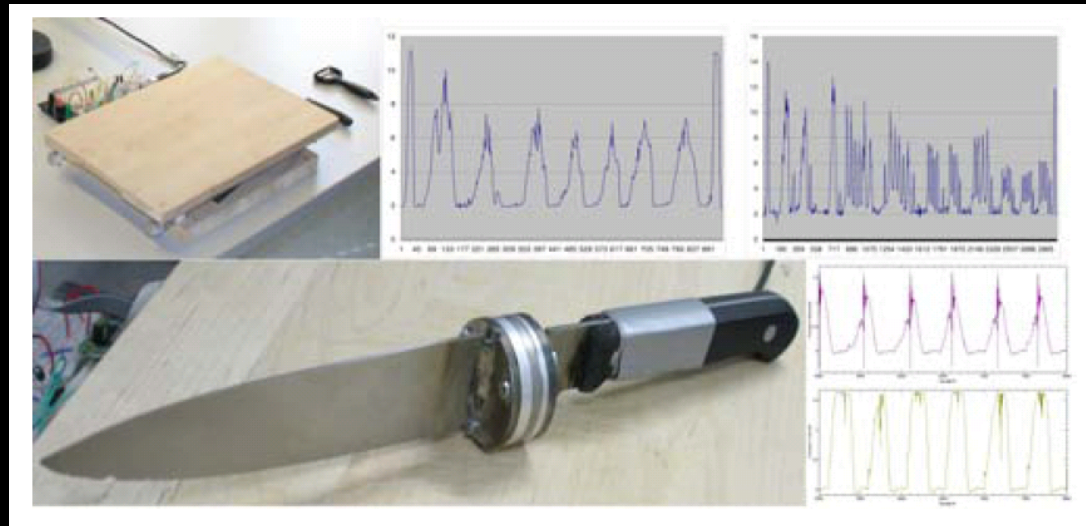
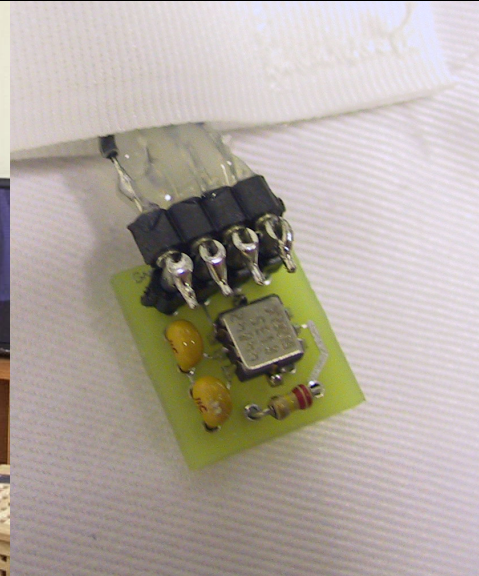
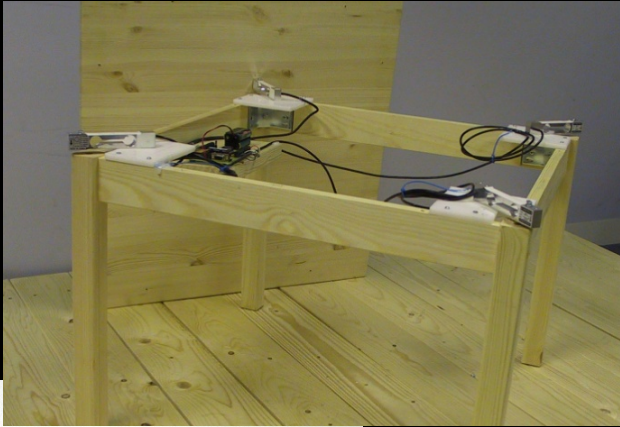


A. Schmidt, A. Takaluoma and J. Mäntyjärvi, Context-Aware Telephony over WAP, Personal Technologies 4(4), December 2000. pp. 225-229.



A. Schmidt, T. Stuhr, H.-W. Gellersen. Context-Phonebook - Extending Mobile Phone Applications with Context. Third Mobile HCI Workshop, Lille, Sept.

Aware – Everything



Some lessons learned

- Technology matters - prototyping interactive systems is essential to understand the real issues
- Software is the really hard and difficult part – not hardware
- The value (and experience) for the user is at the key factor for success
- our understanding of privacy, and what we consider private has radically changed (and is still changing)

```
public partial class MainPage : PhoneApplicationPage
{
    Accelerometer accelerometer;

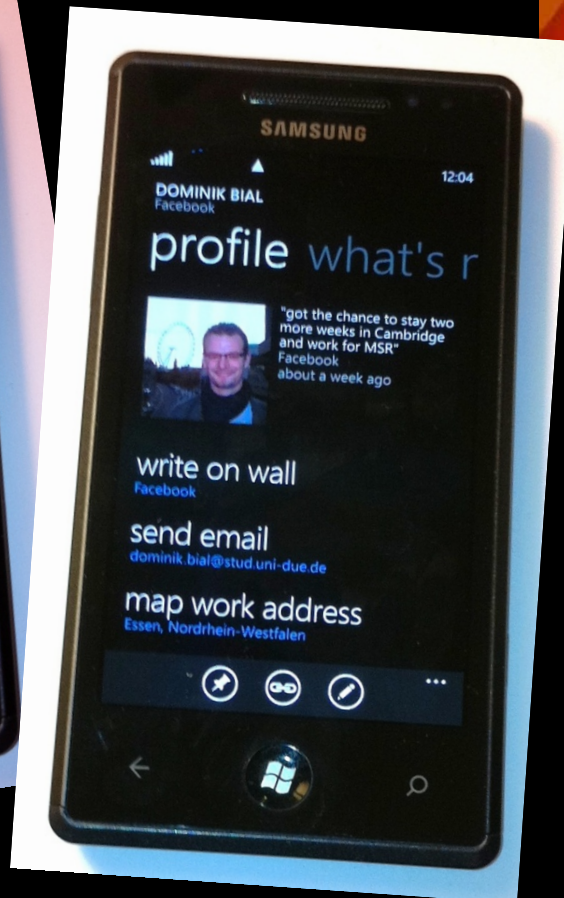
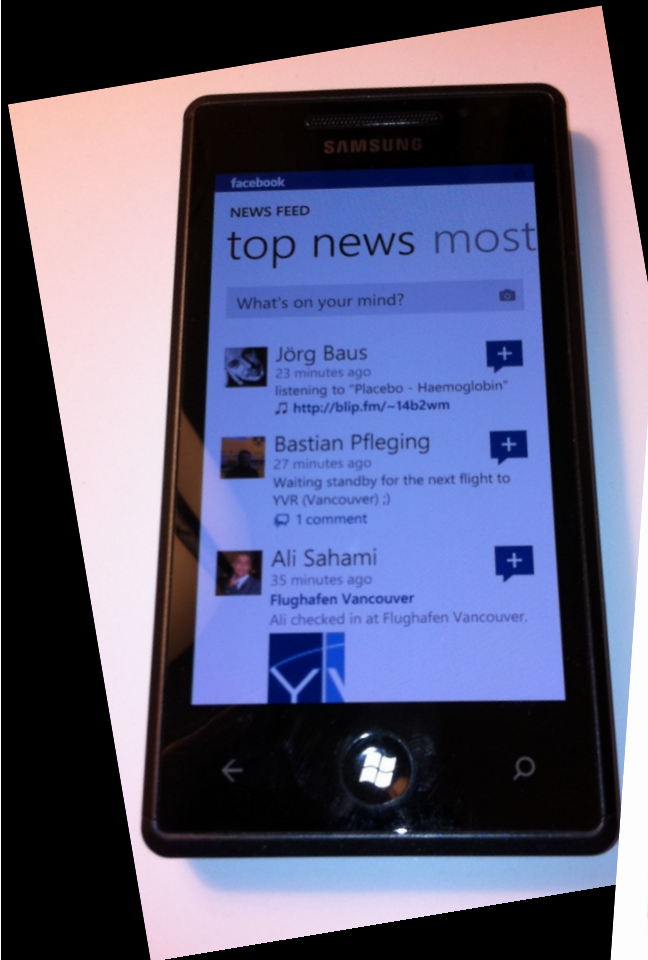
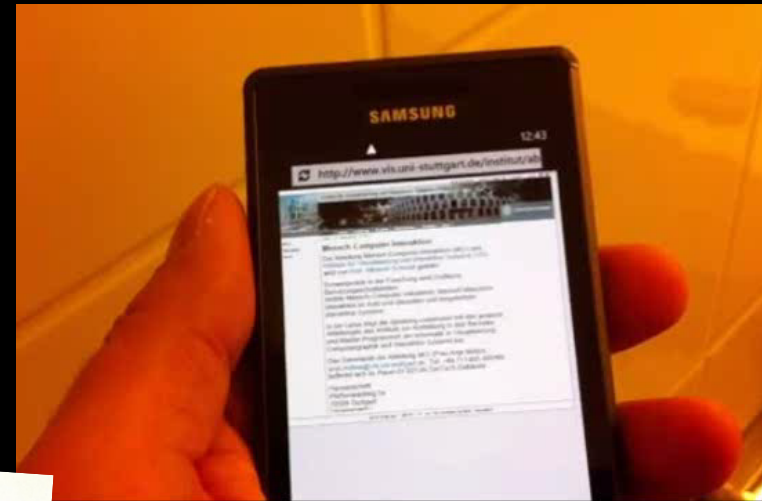
    public MainPage()
    {
        InitializeComponent();
        // create a new instance
        accelerometer = new Accelerometer();
        // register a callback function for when
        accelerometer.ReadingChanged += new EventHandler(accelerometer_ReadingChanged);
        // start the accelerometer
        accelerometer.Start();
    }

    void accelerometer_ReadingChanged(object sender, AccelerometerReadingEventArgs e)
    {
        // required as from here the textBlocks are not yet visible
        Deployment.Current.Dispatcher.BeginInvoke(() =>
        {
            ChangeUI(accelerometer.Reading);
        });
    }

    void ChangeUI(AccelerometerReadingEventArgs e)
    {
        // show the values on the screen
        textBlock1.Text = "X: " + e.X.ToString("0.00");
        textBlock2.Text = "Y: " + e.Y.ToString("0.00");
        textBlock3.Text = "Z: " + e.Z.ToString("0.00");
    }
}
```

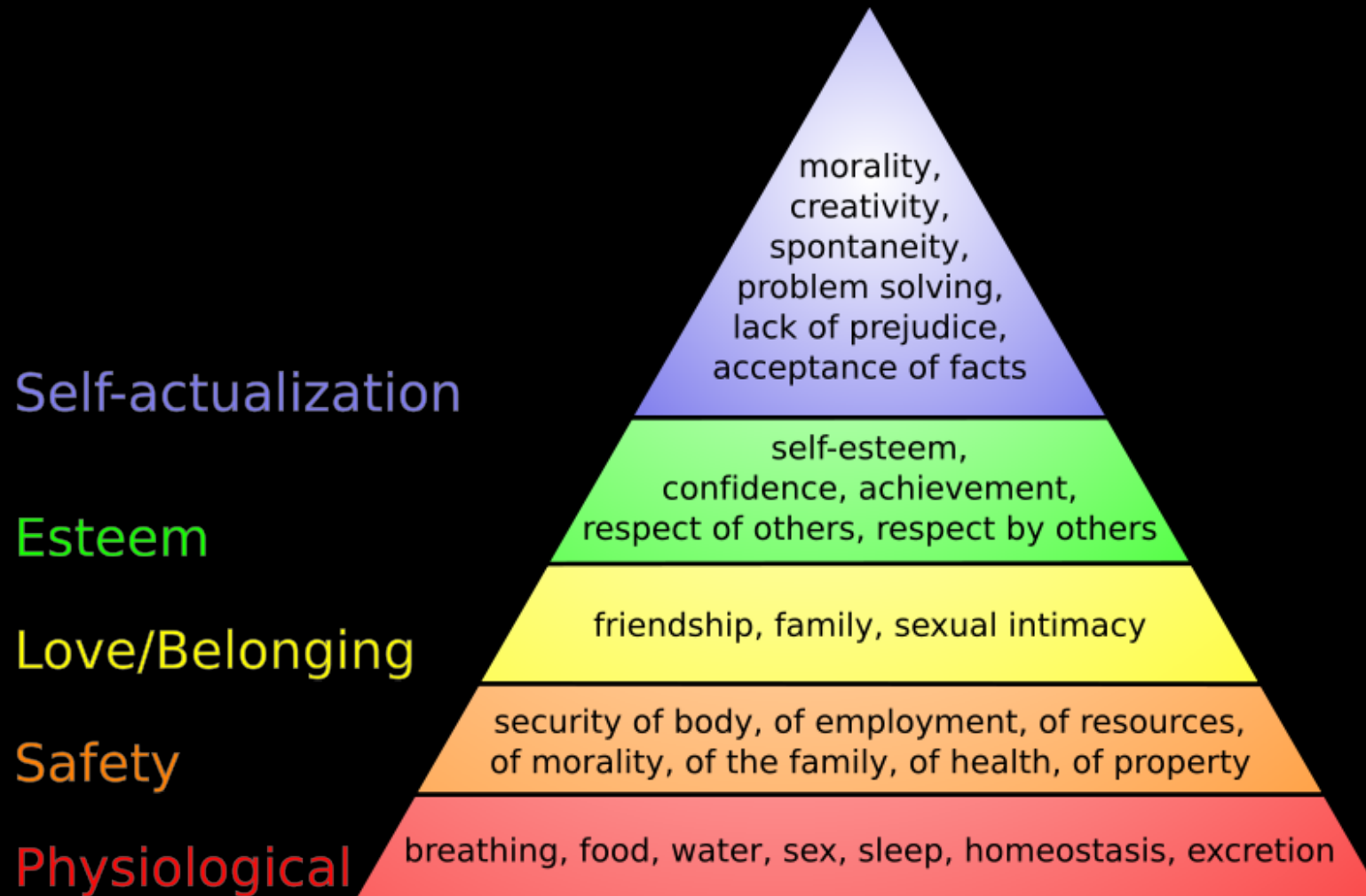


Mobile Devices and Applications



Equipped with many
Sensors
Supporting implicit
interaction
Location and
context-aware
Sharing context

Maslow's Hierarchy of Human Needs

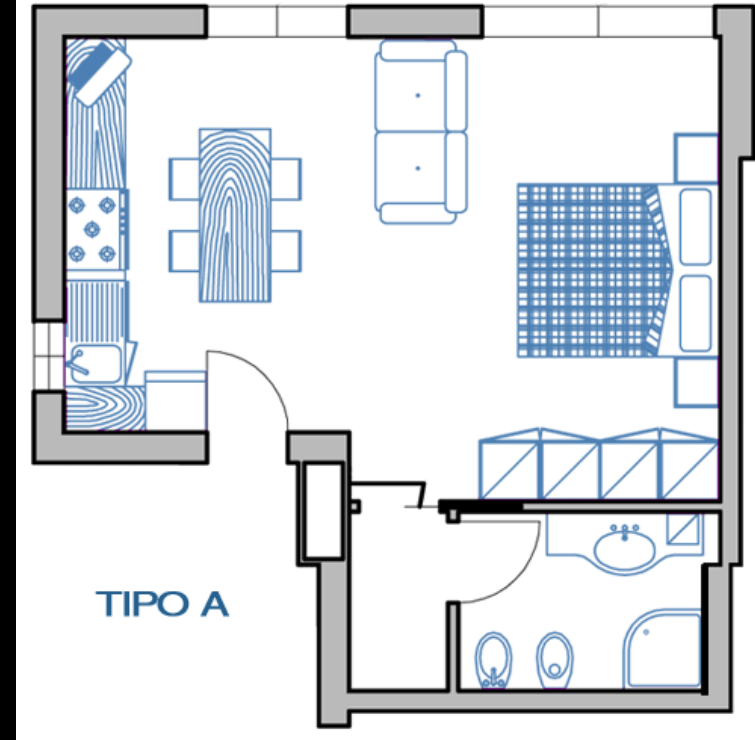


Vision 1

Communication and Presence, Perception

Communities of the future

(selectively) sharing a one-room-apartment with all your “friends”





100 Million Experiences

collected and shared in real time

Albrecht Schmidt
Mein Profil bearbeiten

- Neuigkeiten**
- Nachrichten **33**
- Veranstaltungen **5**
- Freunde **36**
- PETMEI 2011 **7**
- Gruppe gründen ...
Alle anzeigen
- Spieleanfragen **13**
- Anwendungsanfragen **5**
- Mehr

Freunde im Chat

Neuigkeiten Hauptmeldungen · Neueste Meldungen

Teilen: Status Foto Link Video Frage

Was machst du gerade?

Florian Alt
Our plane to Vancouver



vor etwa einer Stunde via Android · Gefällt mir · Kommentieren · Teilen

Simon Bös a small Dash-8
vor 33 Minuten · Gefällt mir

Schreibe einen Kommentar ...

Bastian Pfleging
Waiting standby for the next flight to YVR (Vancouver) ;)

Stefan Sonnenberg Good luck ;-)
vor 2 Stunden · Gefällt mir

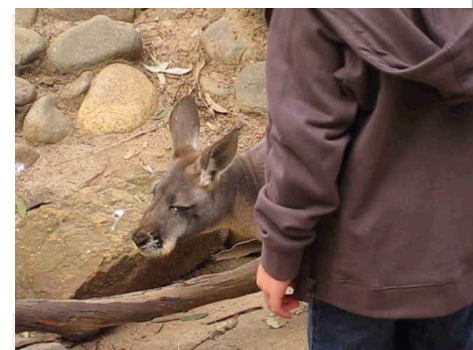
Bastian Pfleging Just got the boarding pass... Without paying the 100 extra fee ;)
vor etwa einer Stunde · Gefällt mir

Schreibe einen Kommentar ...

Bevorstehende Veranstaltungen Alle anzeigen

Welche Veranstaltung?

- 5 Veranstaltungseinladungen
- Kristina Andersens Geburtstag Alle anzeigen

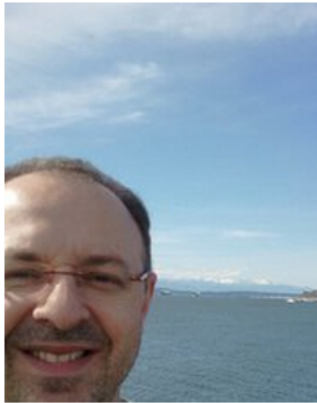


Werb auf Facebook



Informiere über 500 Mio. aktive Nutzer auf Facebook über dein Unternehmen. Sprich dein Publikum an und entwickle so deine Marke online.

Chat (10)



Albrecht Schmidt

prof bei Universität Stuttgart Hat Informatik hier studiert: Universität Ulm Wohn in Satteldorf Aus Crailsheim Füge Sprachen hinzu, die du sprichst Profil bearbeiten

Profil bearbeiten



Teilen: Status Foto Link Video Frage

Was machst du gerade?



Gesponsert Werbeanzeige erstellen

Lust auf Abenteuer?



Dann mach mit bei der spannenden Schwarzjagd und gewinne fantastische Abenteuerreisen zu schwarzen Feuerbergen und Vulkaninseln!

3.312 Personen gefällt Spee.

Gefällt mir

Pinnwand

- Info
- Fotos (13)
- Notizen
- Freunde

Freunde (294)

- Mirjana Spasojevic**
Nokia
- Susanne Boll**
Universität Oldenb...
- Dominik Bial**
- Jan Gerbecks**

Albrecht Schmidt
Just standing next to an "Ancient pillar of computing beyond the desktop"... according to Alois Ferscha (won't tell you who the ancient pillar is...)
Mittwoch um 16:44 via iPhone · Gefällt mir · Kommentieren

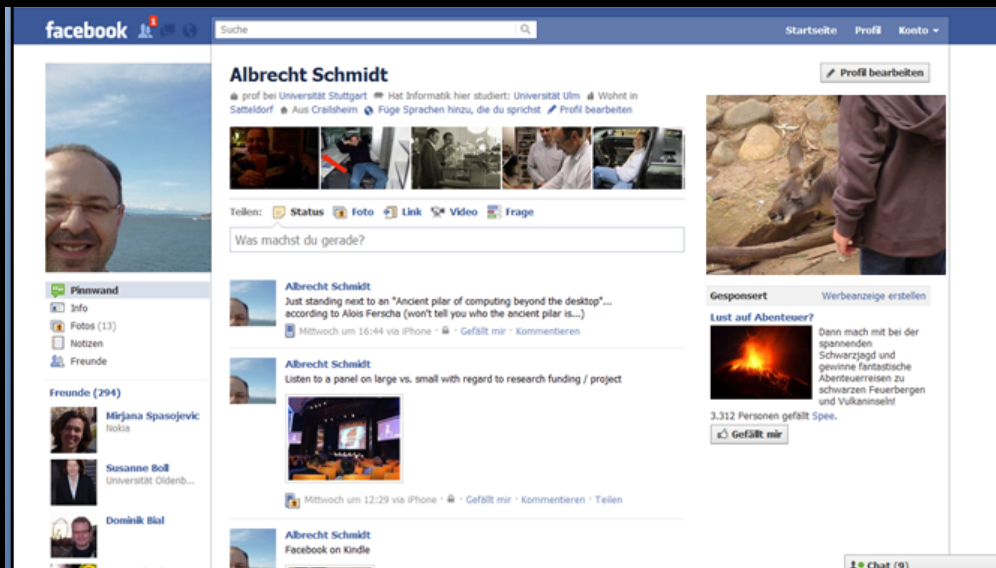
Albrecht Schmidt
Listen to a panel on large vs. small with regard to research funding / project

Mittwoch um 12:29 via iPhone · Gefällt mir · Kommentieren · Teilen

Albrecht Schmidt
Facebook on Kindle


Chat (9)

Scenario 100 million people stream their 1st person view in real-time



Support for real-time as well as archive access

Indexed by location, co-location, events, context-information, ...

Vision 2

A Predictable World

Looking into the future

Making our life – and the world
in general – more predictable



<http://img.dailymail.co.uk>

Perception beyond the Here and Now

By the middle of the century the **boundaries between direct and remote perception will become blurred**. By the it will be hard to discriminate real-time perception apart from historic content or future predictions.

Perception beyond the Here and Now

Masses of networked sensor-
equipped computing devices are
**overcoming longstanding temporal
and spatial boundaries to human
perception**

Perception beyond the Here and Now

**Ethics and values are the central
design material of this century**

Summary

- Blurring boundaries of perception
- overcoming fundamental temporal and spatial boundaries to human perception
- considering ethics as design factor



Albrecht Schmidt, Marc Langheinrich, Kristian Kersting, "Perception beyond the Here and Now," *Computer*, vol. 44, no. 2, pp. 86-88, Feb. 2011, doi:10.1109/MC.2011.54

Questions?

Comments?

- Visit my websites at:
<http://albrecht-schmidt.blogspot.com/>
- Recent articles in IEEE Computer
 - Ubiquitous Computing – are we there yet? (2010)
 - Perception beyond the Here and Now (2011)