# Wireless Wearables

# Combining wireless, wearables and ubicomp environments

Pekka Nikander

`http://www.nomadiclab.com/~pnr/`

*Chief Scientist*
*Ericsson Research NomadicLab*

# Trends

- Gadgets become clothing
    - Both have utility and fashion value
    - No more separate PDAs, phones, etc, just smart accessories worn like watches, glasses, or clothes
- Environments become smart
    - Radio beacons, short range internet connectivity
- New physical user interfaces (new UI devices)
    - Non-intrusive output, one-handed input, ...
- Context awareness
    - Location, social context, noice level, calendar schedulings, walking / in car / in church / in meeting
- Always-on communications

# Problems

- Privacy

  - Must be build in from very basic architecture
    * E.g. tracking MAC address may be used to defeat privacy [RFC3041]

  - Technology *must* allow privacy, whether privacy is regulated or open market is a different issue

- User interfaces

  - Visual user interfaces are clumsy while on move

  - UI must become natural part of behaviour

- Power management

  - Batteries will become better, but usually you do not expect that you need to recharge your watch

  - $\rightarrow$ Recharging must be made a natural part of the physical user interface!

# Short term issues

- WLAN etc replace most cables at homes (and offices)
    - I have three Apple AirPort WLAN BaseStations
- Simultaneous multi-access (e.g. UMTS + WLAN)
    - http://www.nomadiclab.com/~pnr/homeless/
- Ad-hoc networking for peer-to-peer applications
    - No infrastructure, fully symmetric environment
    - Security based on ad hoc relationships (like PGP)
    - Social information sharing, e.g., sharing files, looking for common meeting time, etc.
        - * See e.g. the Siesta project, http://siesta.foo.fi/
- Huge growth in short-range communications between personal devices; less changes in long-haul area