Post-graduate research topics at INIT

Industrial Information Technology Laboratory (INIT)
Helsinki University of Technology

INIT in a nutshell

- Founded 1.6.2001
- Staff equal to some 25 full-time persons
- 4 PhDs, 6 own PhD students
- Operates at two HUT sites:
  - Otaniemi (17)
  - HUT Lahti Center (8)
- 12 EU-projects since 9/2000: 9 IST5, 1+1 Eureka, 1 ProAct

- Consists of two units:
  - Research Unit (19)
    - Interactive Environments
    - Mobile Applications
    - Virtual Prototypes
  - Educational Unit (6)
    - MSc programme
    - e/mLearning research
INIT in a nutshell...

- Some 20 publications in three years
- Lots of technical reports due to participation to EU projects
- More than 30 active partners in industry/academia
- First PhD by 9/2003

- Researchers have various backgrounds – also required due to the research topics dealing with diversified technologies and skills

Interactive environments

- INIT studies and develops interactive systems for addressing multiple users/spectators
- Previous work includes various large-size projections and showrooms, such as EXPO2000, Radiolinja Showroom, Nokia Showroom, Kone intelligent elevator, Santa Claus land...
- Biggest challenges are in real-time animation/3D graphics, mobile/fixed communication, sensor systems for interaction (also deviceless)
Mobile pilots and applications

- INIT designs & implements various mobile pilots
- Experience in mMiddleware, mTourism, mCommerce, mStreaming, mControl, mPayment, mAuthentication...
- Biggest challenges are in SW design (in particular MW design as trying to develop generic solutions), mobile system integration and developing add-ons to terminals

Mobile shopping application

- SUPERMARKET STORE WITH RFID TAGGED PRODUCTS
- SHOPPING LIST
- INTELLIGENT SHOPPING CART WITH e.g. RFID READER, WLAN, LBS...
- PRODUCT INFO & SYSTEM SERVER
- WHOLESALES
- REPLENISHMENT
Mobility

Location-based pilots – e.g. Mobile indoor guide on Psion netBook

![Location-based pilots diagram]

Prof. Tuominen, INIT/HUT
PG Research Seminar, Otaniemi, 13.3.2003

Mobility

Mobile ticketing application

![Mobile ticketing application diagram]

Prof. Tuominen, INIT/HUT
PG Research Seminar, Otaniemi, 13.3.2003
Mobility

Example on Middleware related research - same client/services on multiple mobile platforms

Virtual prototypes

Virtual prototypes and simulation

- INIT utilises graphical simulation and modeling tools for various manufacturing system related problems
Virtual prototypes and simulation

- INIT utilises graphical simulation tools for various manufacturing system related problems
- Previous work in off-line robot programming and industrial automation
INIT utilises graphical simulation tools for various manufacturing system related problems

Previous work in off-line robot programming and industrial automation

Biggest problems in (control) algorithm design and visual simulation – especially if real-time demands exists