The iDorm: Gateway to Heterogeneous Networking Environments

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University of Essex

• Parkland of 200 acres.
• Royal Charter in 1965.
• 5,926 Students.
• 25% Post Graduates.
• 24% Overseas (120 Countries).
Intelligent Inhabited Environments (IIE) Group

- 12 members comprising Ph.D. students, research assistants and senior academics.
- Formed in 1995 (drawn from embedded-computing and AI personnel traced to departments origins in 1967).

“investigation of methods for making compact real-time intelligent embedded-agents and their infrastructure (programming and communications) applied to intelligent-inhabited environments (e.g. intelligent-buildings)”

Intelligent Inhabited Environments (IIE) Group

Expertise
- Compact real-time physically embedded-agents design.
- Soft Computing (fuzzy & genetic) methods.
- Agent communication & languages.
- Embedded-system design.
- Networking technology.
- Simulation.
- Mobile robots.
The Intelligent Dormitory (iDorm)

- A test-bed for Intelligent Inhabited Environments Research.
- Multi-use space i.e. (study, sleep and relax).
- Multi-user environment
- Heterogeneous networking environment.
- Sensor and actuator rich.
- Open heterogeneous environment

Gateways and Intelligent Environments

- Intelligent agents are usually deployed to control localised space (e.g. a room).
- Agent and gateways equate to the same space, rooms and buildings.
- Scalable.
- Economic.
- Gateway provides a method of accessing data mined by an agent.
**iDorm Network Infrastructure**

- 3 Networks, 1-Wire, Lontalk & IP.
- HTTP interfaces.
- XML messages.

**iDorm Gateway Communication**

- **XML**
  - Easy to parse
  - Human readable
  - Established standard

- **HTTP**
  - Simple
  - Lightweight
**iDorm** User Interfaces

- VRML
- WAP
- WEB
- Voice Recognition
- Tangible interfaces (Switches)

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**Scenarios**

- Study, relaxation, sleep and entertainment scenarios.
- Manual, automatic and intelligent scenarios.
- Scenarios for the care for the elderly or infirm
Intelligent Agents

- Can extract patterns from user’s behaviour.
- Help reduce cognitive load.
- Monitor and control safety systems.

Problems with Intelligent Agents

- Compact reasoning, planning & learning
- Dynamic (and sometimes numerous), non-deterministic & ad-hoc agent/people assemblies
- Particularisation versus generalisation
- Temporal processing (inc past events)
- Multi-agent cooperation or coordination
- Non-intrusive operation (with people firmly in control)
- Large input vectors
- Stimuli Focusing (ranking value of parameters)

References