dinam: A Wireless Sensor Network Concept and Platform for Rapid Development
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Intelligent environments

- Augmented Reality
  - Human intelligence
  - Additional information Overlays

- Programmable Reality
  - User can specify environmental behavior
  - User empowerment, injects intelligence into environment

- Proactive Reality
  - Ambient Intelligence
  - Self-adapting environment
OBSTACLES

What stands between us and a pervasive programmable reality?

- The technology is available!!!
- Top-down, discrete development flow
  - Design application, set up environment, write code, debug, compile, flash, evaluate, repeat.
- Portability / Compatibility issues
  - Libraries, hardware versions, drivers, …

“simple things must be simple [to develop]”
GOAL

- Create a tool for programmable reality
  - Reality means everyone!
  - Augmented reality hard to develop, easy to use
  - How can we enable a programmable reality which is also easy to use?

- Wireless sensor networks are a good starting point: post-hoc computing
  - BUT: Tremendous development energy required
  - System complexity in terms fields of expertise required
CONCEPT: dinam

- Self contained wireless sensor node, application, development environment

- Extended concept with wireless
PLATFORM

- Based on the D-Bridge
- Access over web server in browser
  - Development environment
  - Data visualization
  - WSN Communication
DEVELOPMENT ENVIRONMENT

- Novel BASIC flavor for WSNs
- Interpreted at node
- Command I/O over AJAX
- Console or script-based programs
- Integrates segmented development process
EVALUATION

- Simple evaluation of application development effort
  - Of the 5 subjects, none had any experience with BASIC
  - Each student given 5 Minute syntax and functional introduction
  - Subjects were asked to calculate and print the average of 100 received WSN temperature packets to the console
- Time required for completion measured
RESULTS

- **Time**
  - Minimum at 3:50
  - Maximum 7:11
  - Average time of 5:20

- **Implicit baseline: application on COTS Node?**

- **Interesting initial observations**
  - Free text editor significantly more efficient
  - Previous programming experience greatly affects learning curve, regardless of language
CONCLUSION

- The age of programmable reality has arrived
- The tools to bring it to the masses are still missing
- The dinam concept is enabling technology for this paradigm
  - Non-expert user-friendly interface for configuring the Programmable Reality
  - Reduces normal discrete programming to a fluid process
Workshop on ULC-WSN Output

- Evaluation of the dinam concept for extremely low cost, low effort applications

- Insights
  - WSNs must be easy to install and maintain
  - The killer app will reduce cost of its platform
  - App stores can help cover costs

- Indicate that the dinam concept will facilitate ULC-WSN development
That’s All

Thank You!

Questions?