19589 - PS Telematik Projekt: Embedded Sensor Web

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Organization

• Prerequisites: Bachelor or Vordiplom
• Supervised lab course
• Task handed to group of 9 students
• “Projektseminar“: Praktikums- oder Seminarschein (decide early!)
• ECTS-credits: 10
• Hardware supplied for whole semester to all attendees
Course Requirements

• No exam
• Attend lab hours
• Presentation
• Hand in your work before deadline containing:
  - Commented/documented source code ("doxygen style")
  - Documentation describing your task and the solution
  - If your task could not be solved successfully describe the problems and what is missing!
  - Presentation slides
• Minimum of 150 work hours (150h/14weeks ≈ 10.7h/week)
• Seminarschein: Focus on theoretical background
Required skills and knowledge

• Experience with the C programming language
• Experience with the Java programming language
• Courses: Computer Architecture, Telematics, Mobile Communications
• Doxygen
• Subversion
• Teamwork, teamwork, teamwork!!!
Schedule

• **09.04.2008:**
  - First Meeting
  - Introduction, Requirements
  - Handout of customer requirement specification
  - Preliminary team forming
• **16.04.2008:**
  - Introduction to ScatterWeb² firmware (first steps)
  - Final team forming
• **23.04.2008 - 16.07.2008:**
  - Supervised lab hours, team meetings, milestone presentations
• **14.07.2008:**
  - Hand in your presentation slides (PDF only!)
• **16.07.2008:**
  - Final Event: Talk + Demo
• **23.07.2008:**
  - Hand in your work (deadline is 24:00), return hardware
Wireless Sensor Network (WSN)
- spatially distributed autonomous devices
- equipped with sensors
- cooperative monitoring and computation
- origin: military
- embedded systems
- wireless ad-hoc network
- network size: up to 10,000 nodes
• Home Automation Wireless Sensor Network
  - nodes with temperature and humidity sensor
  - GPIO pins to connect actuators or external sensors
  - data aggregation
  - solution encompassing all ISO/OSI layers
  - web based management + configuration
  - contour map
“Schein” requirements

• Developed solution has to work
• Documentation must be available (about 40-50 pages per team)
• Presentation of all team members
• Meet deadlines
• Optional: Non-mandatory features (improve grade!)
• Attend Wednesdays meetings (at least 85%)
  - inform team members and advisors on absence
  - hand in attest/doctor's note
  - make up time at home
What is provided?

• Rudimentary operation system
• Several code packages
• Open source compiler toolchain (MSPGCC)
• Sensor nodes, required cables, flash interface
• Project description/customer requirement specification
Milestones

- **07.05.08:**
  - Task assignment to team members
  - General approach to solve the problem
  - Interface definitions, selected routing protocols, management application prototype

- **11.06.08:**
  - Mid-term presentation

- **02.07.08:**
  - Preview of final event
  - Overview: What's finished, what's missing?

- **16.07.08:**
  - Final Event: Talk + Demo
Task till next week

• (Re-) Read course requirements
• Read customer requirement specification
• Get familiar with C, Java, Doxygen, Subversion, LaTeX, ...
• “Get clear picture of affection“
• Keep in contact with (preliminary) team
• Optional: Start with background research of your task
THE END

Questions?