ATEMU

Sensor Network Emulator / Simulator / Debugger

Overview

- What is ATEMU
- Installation
- Major Features
- Examples:
  - Blink
  - RedLightToggle, GreenLightToggle
- Problems with ATEMU

What is ATEMU

- Emulator
- Simulator
  - Large scale sensor network emulation studies in controlled environment
  - Education, no hardware required
- Debugger (Xadtb GUI-Tool)
- Just Mica2 modes (for now)

www.cshcn.umd.edu/research/atemu/
Installation

- Cygwin (New Installation)
- Don’t use TinyOS Installation
- Different Libraries and Programs:
  - gettext, GTK, libiconv, glib, ...
  - Use setup.exe
    - http://web.sfc.keio.ac.jp/~s01397ms/cygwin/

Major Features (1)

- Complete emulation of AVR instruction set
  - AVR: RISC processor family
- Partial Support for all MICA2 board components
  - Just Radio-Component supported so far

Major Features (2)

- Loading of ELF-executables and Motorola SREC images
  - ELF: main.exe for Mica2 modes
  - SREC: in same folder
I. Example: Blink

- Message Type
  - Opcode (rest of message is the machine instruction)
  - Event (what device triggered event, which msg. sent by device)
  - Debug (breakpoints, watchpoints)

- Machine instruction (hexadecimal)
- Assembly function name
- Registers, values

Major Features (3)

- Graphical debugging environment
- Xadtb (Subdirectory of ATEMU, atemu/xadtb)

Major Features (4)

- Support for arbitrary number of breakpoints and memory watchpoints
  - Set of breakpoints by right-click on Assembler-Code
  - Fixed breakpoint address
Major Features (5)
- Support for multiple sensor nodes in a sensor network
- Need to write a runfile

Major Features (6)
- Symbolic debugging support
  - Source-level stepping
  - Run-time variable inspection
- Different Sensor Nodes can run different programs

II. Example: RedLightToggle, GreenLightToggle
- Versions of Blink
Major Features (7)

- Possibility to support other hardware platforms in future

Problems with ATEMU

- Installation (!!!)
- After „break“ not possible to continue
- Source Code Window does not work
- No Documentation, FAQ (1 question)

Thank you.