Collaborative Mesh Networking

Instructor: Rob Faludi
Week 6

Rock Paper Scissors

- Demo project results

  - discuss questions, problems, successes, learnings

Readings

- None this week!

Warmup

- Hello
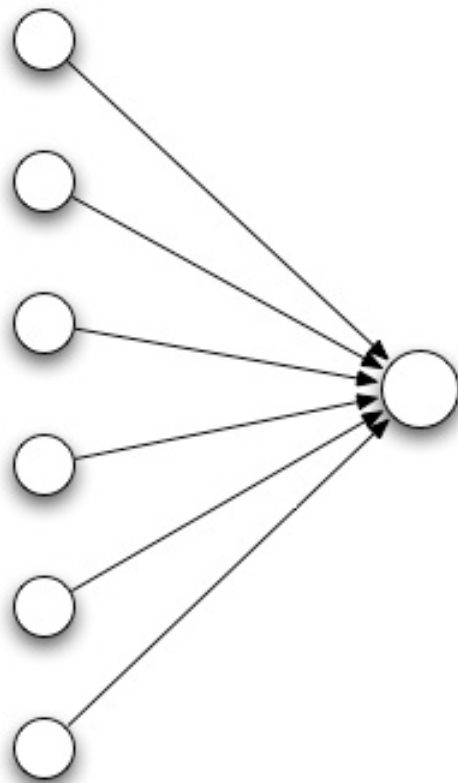
Coordination Project

- Ideas from each group

- Cooperation and/or interaction with other groups
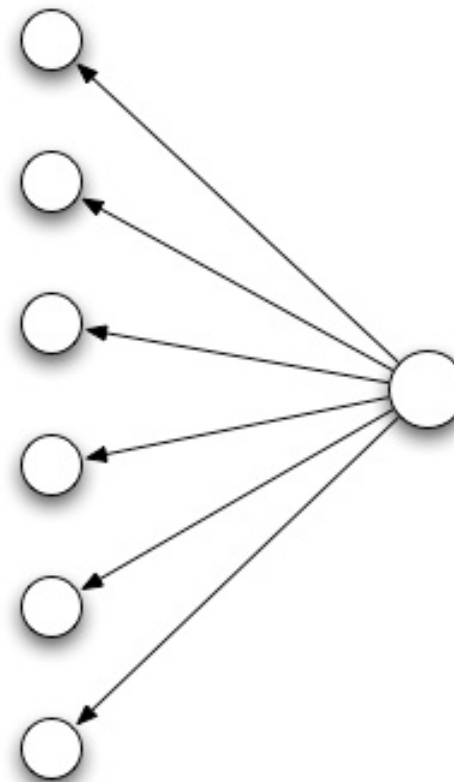
Types of Networks

- Sensor network

- ad-hoc

- self-healing

- home network

- interactions (sociable objects)

- hide & seek (Shell House)
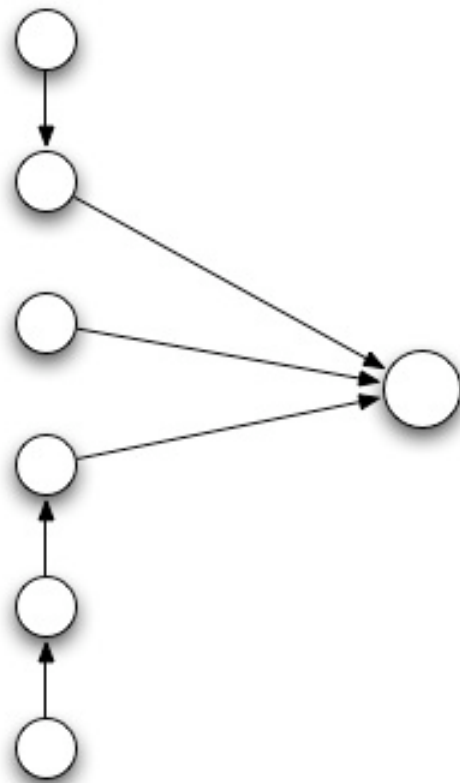
- gatewayed systems

802.15.4 Sensor / Display
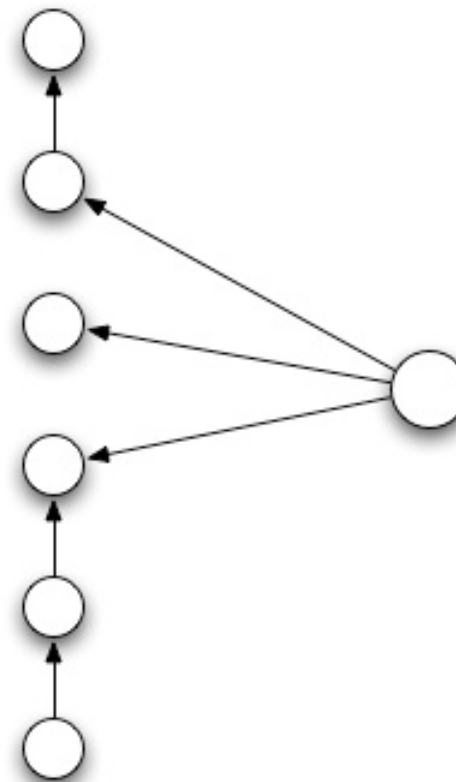
ZigBee Sensor / Display
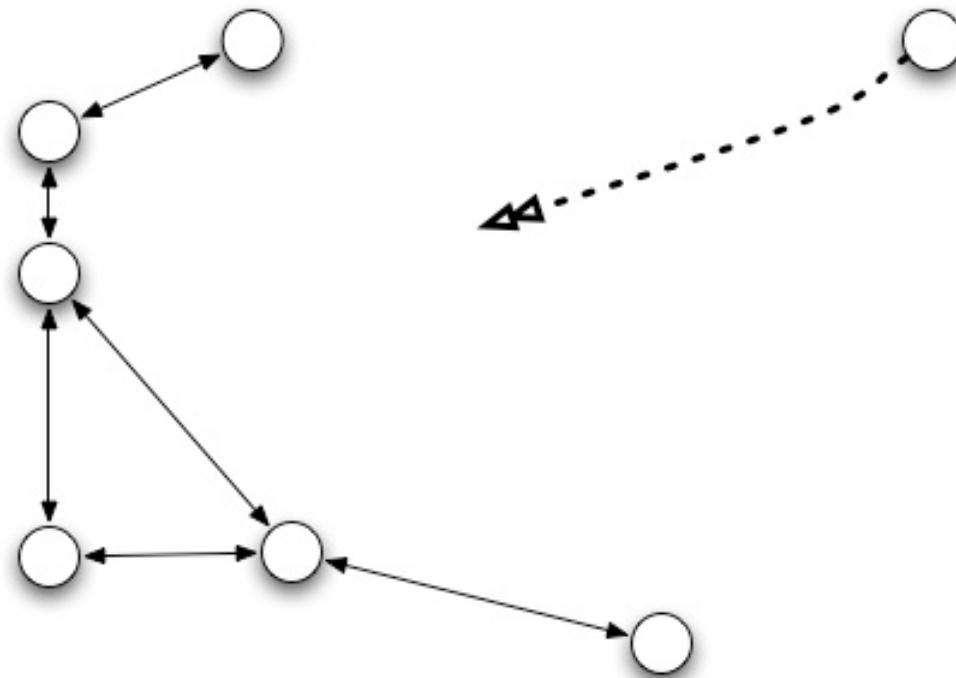

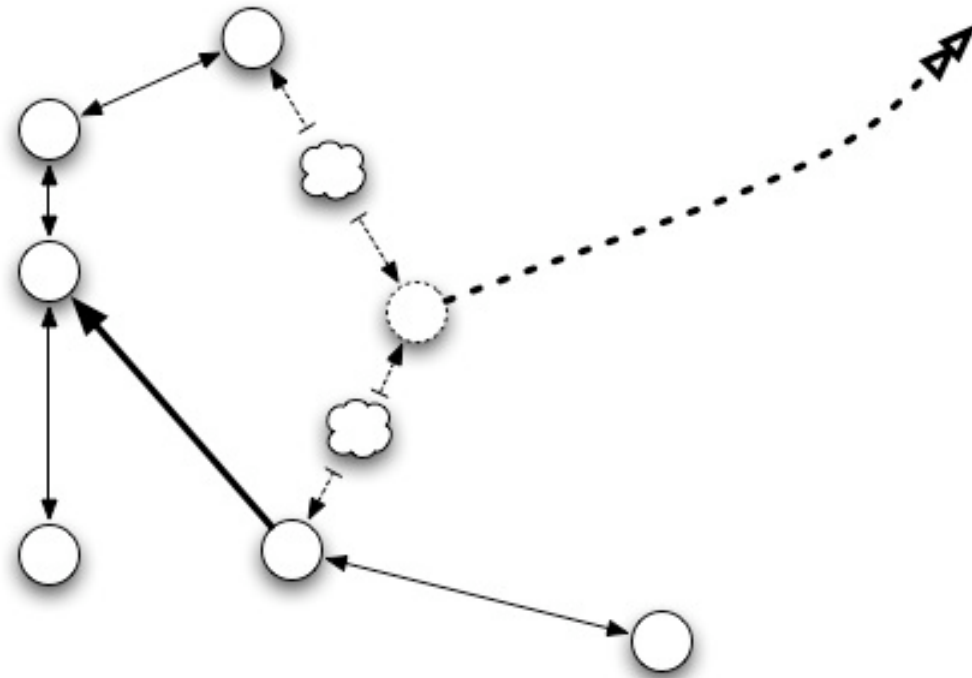Sensor Network   Display Network

Ad-hoc

Ad-hoc Network

Self-healing

Self-healing Network

I/O Intro

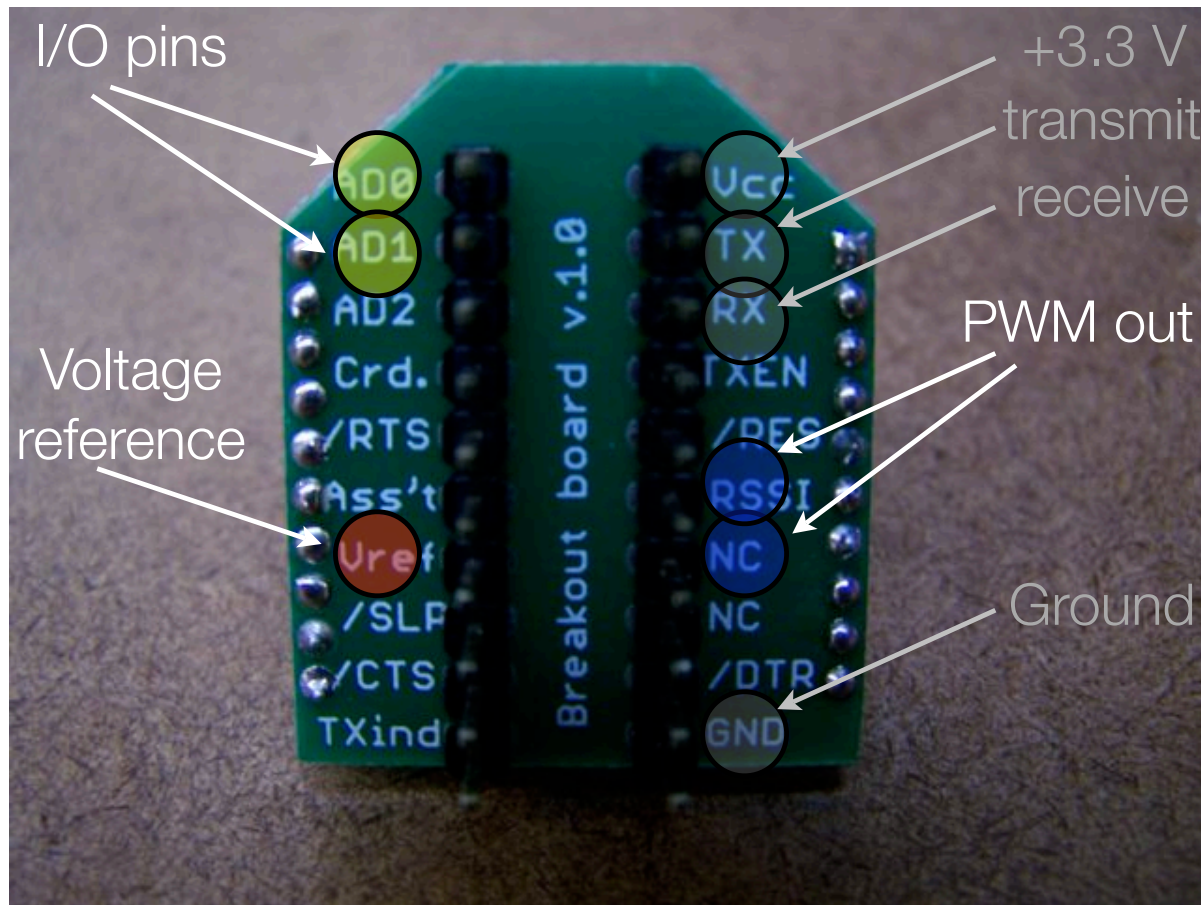- For simple input and/or output

- Eight digital input/outputs

- One additional digital output

- Seven analog inputs

- Two analog outputs

- But <u>not all at once</u>! Pins are shared.

I/O Why

- Why:

  - Save space, save power, save weight and save money

  - Reduce complications

- Why not:

  - Limited inputs/outputs

  - No access to logic

  - Each radio must be manually configured

Input/Output Wiring

I/O AT Commands

- ATD0...D8 -> configure pins for I/O

- ATIR -> sample rate

- ATIT -> samples before transmit

- ATP0...P1 -> PWM configuration

- ATIU -> I/O output enable (UART)

- ATIA -> I/O input address

Example Configuration

- ATID3456 (PAN ID)
  ATMY1 my address 1
  ATDL2 destination address 2
  ATD02 output 0 in analog mode
  ATD13 output 1 in digital out mode
  ATIR14 sample rate 20 milliseconds (hex 14)
  ATIT5   samples before transmit 5

- ATID3456 (PAN ID)
  ATMY2 my address 2
  ATDL1 destination address 1
  ATP02   PWM 0 in PWM mode
  ATD15 output 1 in digital out high mode
  ATIU1   I/O output enabled
  ATIA1   I/O input from address 1

Readings and Assignments

- Readings

  - Tom Igoe's "Making Things Talk", Chapter 7: http://rob.faludi.com/teaching/cmn/readings/MTT_Chp7_F1_ti04.pdf

- Assignment

  - Continue with coordination project

  - Due date: 10/24