Embedded Systems
IAY0330

Project: Fishfeeder

Kätlin Lahtvee, Aivar Koodi

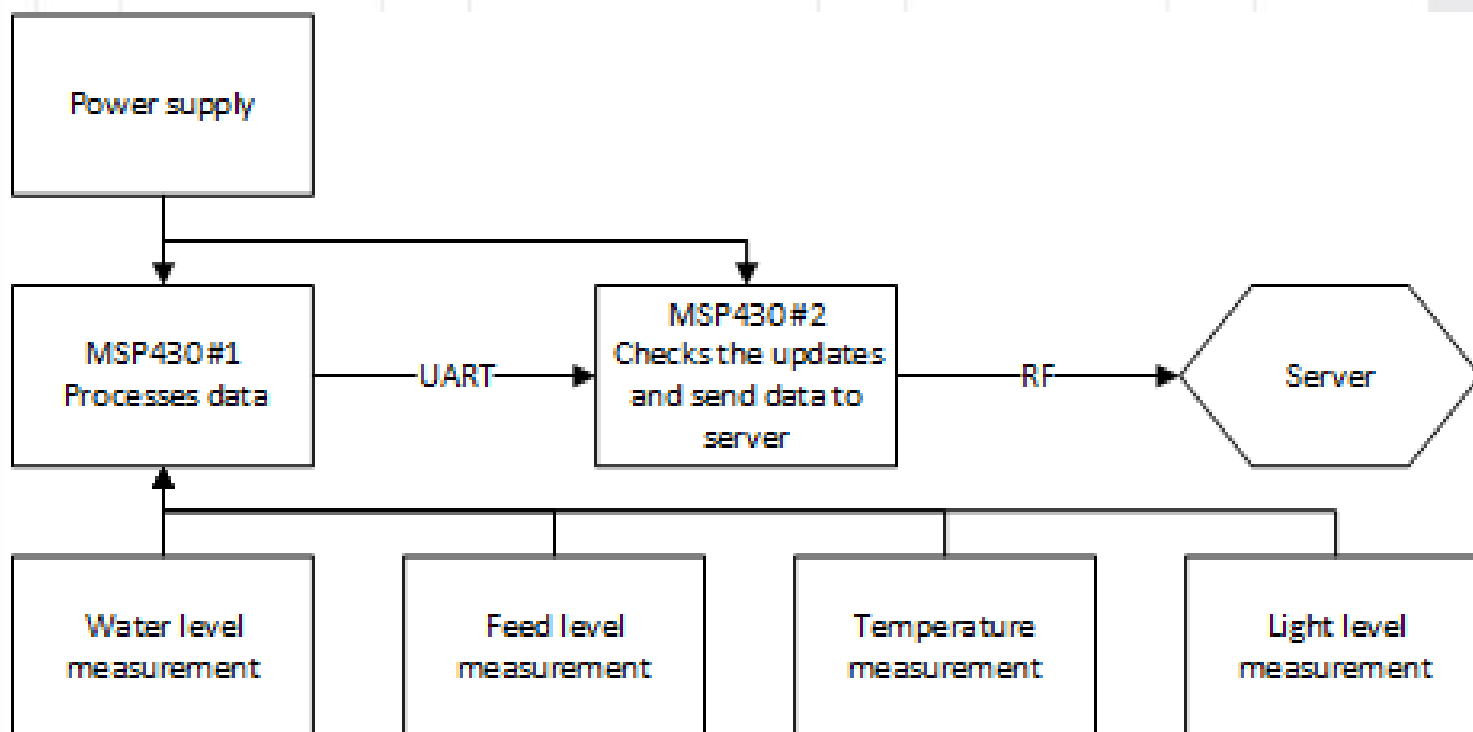Sander Sinijärv, Martin Grosberg

Marek Aare

Objective

- **Autonomous aquarium**
  - Temperature
  - Light
  - Feeding system
  - Feed level
  - Filter cleaning reminder
  - Water level

System Architecture

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Wiring overview for sensor MSP430

MSP430 - 1	Description	RF Module	MSP430G2553	Motor Driver
Light Sensors	Light sensor		P1.0	
	Ground		GND	
Water level sensor	Water level sensor		P2.0	
	Ground		GND	
Motor driver	Motor IN1		P2.2	IN1
	Motor IN2		P2.3	IN1
	Motor IN3		P2.4	IN1
	Motor IN4		P2.5	IN1
	Ground		GND	GND
	Power		TP1	VCC 5+
Temperature sensor	Temperature sensor		P1.4	
	Ground		GND	
Feed level sensor	Feed level sensor TX		P1.5	
	Ground		GND	
	Power		VCC	
UART connection	UART	P1.1(RXD)	P1.2(TXD)	

Wiring overview for communication MSP430

MSP430 - 2			
Radio sheild	Description	RF Module	MSP430G2553
	Ground	1 GND	GND
	Reset	2 RESET	P2.5
	SPI Conf Chip Select	3 CSCON	P1.4
	Interrupt 0	4 IRQ0	P2.0
	SPI MOSI	5 SDI	P1.7
	SPI Clock	6 SCK	P1.5
	SPI MISO	7 SDO	P1.6
	SPI Data Chip Select	8 CSDATA	P1.3
	Interrupt 1	9 IRQ1	P2.1
	Power	10 VIN	VCC
UART connection	UART	P1.1(RXD)	P1.2(TXD)

Data to server

- Data to send to server
  - Light sensor data
  - Temperature sensor data
  - Water level sensor data
  - Feed level sensor data
  - Filter cleaning necessity

Component description

- 2 x TI MSP 430 launchpad
- 868MHz wireless connection shield
- Light sensor
- Feeding system (Auger)
- Feed level sensors
- Stepper motor + driver
- Temperature sensor
- Water level sensor

Assignements finished

- Light sensor is functional
- Temperature sensor is functional
- Water level sensor is functional
- Feed level sensor is functional
- Cleaning filter reminder is functional
- UART connection between MSP430 boards established
- RF connection between fishfeeder and server establised
- Fishfeeder auger and casing built

Final result
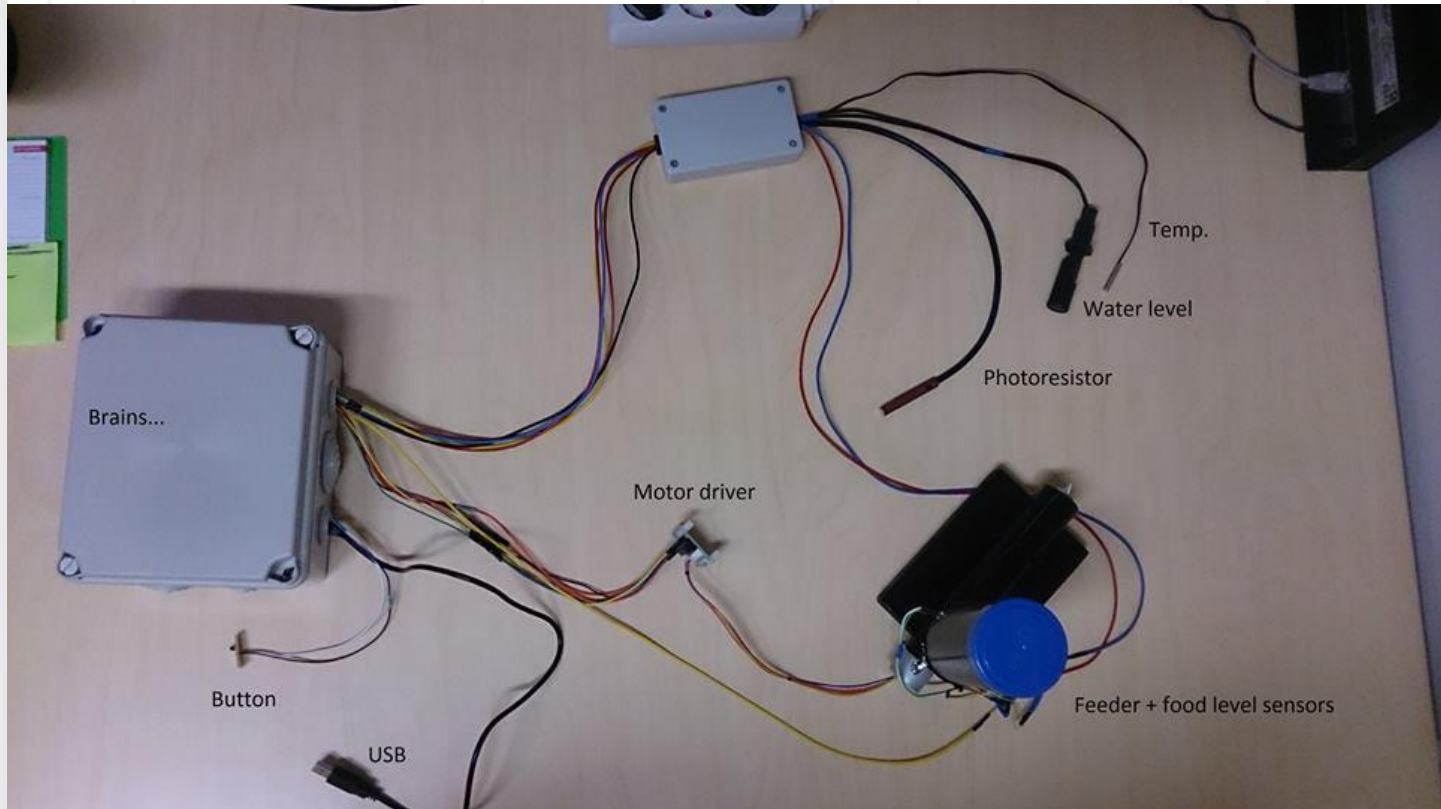
Project Organisation

- Building feeder system-Kätlin/Sander
  - Attaching feeding system
  - Implementing level sensor
  - Building feedtank
  - Programming motor
- Implementing and programming lighting sensor-Sander
- Implementing and programming temperature sensor-Aivar
- Implementing and programming water level sensor-Martin
- Implementing and programming feed level sensor-Sander
- Integrating the codes in one- Marek/Aivar
- Establis connection between MSP430- Marek/ Aivar
- Establis connection to main server- Marek/Aivar

Working Plan

- S6 – hardware ordering
- S7 – working out the system architecture
- S8 – S14 – programming and building the device
- S15 – working solution
- S16 – final project presentation

Cost calculation

- Stepper motor+driver (Bought by team)
- Feeder level sensor (Bought by team)
- Aquarium (Provided by course)
- Light sensor (Bought by team)
- Temperature sensor (10 €)
- Water level sensor (Provided by course)
- TI launchpad (Provided by course)
- Radio module (Provided by course)
- Auger and casing materials (Bought by team)
- Power supply 12V (Provided by course)

- FINAL COST 10 €

Thank you!