

Design Thinking and Electronic Prototyping

Week 2



Aalto University
School of Electrical
Engineering

Salu Ylirisku

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Teams

Nhut (DSD), Tuan (DSD), Sahar (DSD)

Nursalim (DSD), Jussi (DSD), Márton (DSD)

Ngoc (DSD), Jessica (OU), Huy (DSD)

Thong (DSD), Anthony (DSD), Bekzhan (DSD)

Ali Amaan (DSD), Yerzhan (DSD) !

Damiliya (DSD), Michael (Ex.), Leo (DSD)

Aaron (DSD), Alexandre (Ex.), Grégory (Ex.)

Anya Rannuste (DSD)

Project Presentations

Today (15.9.):

Ideas for Useful Products

In 1 weeks (22.9.):

Project Focus

In 4 weeks (13.10.):

Project Plan

In 11 weeks (1.12):

Project Results with Prototype Demo

Diary Dialogue

- **All active course participants have submitted their diary**
- **The diaries were in general EXCELLENT!**
 - Connecting to personal experiences, expectations, understanding, and thinking
- **Most of the diaries were too lengthy – up to 1200 words**
 - Next round, if you go beyond 1000 words, -1pt
 - Aim is around 500-600 words

Reporting vs. Reflecting

“Today we did this, and then we did that..”

This is non-reflective text, just reporting.

Reporting vs. Reflecting

“Making a diary on a book reading doesn’t make me fear as this is what we did in elementary school.”

This is reflective, it connects to experience(s)

Reporting vs. Reflecting

“I’m going to be honest, I have never even seen one of these (Arduino) before, let alone work with one, so I was extremely interested working with it, however I also felt a bit intimidated by it, mainly because of the way the tasks were set up and how the documentation was provided to us.”

This is reflective, it connects to experience and expectations

Reporting vs. Reflecting

“First impression on the Design Thinking and Prototyping course is I am scared. I have no idea what it will be like. I didn’t pay a lot of attention to my Physics class at school. Hopefully, I will be okay with no background in Electronics.”

This is reflective, it connects to experience and expectations

Reporting vs. Reflecting

“Design thinking and electronic prototyping is a whole new concept to me, and so is this diary. Despite reading the example diary the professor wrote, I still cannot quite grasp what really needs to be said here, but I will try my best.”

This is reflective, it connects to experience, expectations, and understanding

Reporting vs. Reflecting

“Professor Salu has assigned my group to think about five useful products, but I found it quite hard since there are already so many useful devices and products in this modern life, besides the useless.”

This is reflective, it connects to experience and understanding

Reporting vs. Reflecting

“The main thing that I understood after reading is that design and practicality should work together to make a thing useful and understandable.”

- Coming towards an argument!
 - ‘The main thing’
- Arguing requires even more thinking
 - You need to be very selective
 - You need to develop a stance, what is important, what is not

Diary dialogue – Emerging Criteria

What is good diary?

1. Length between 300-1000 words with dates +1
2. Covers the project / exercise experience +1
3. Covers thoughts about classes / the book +1
4. Uses referencing and visuals +1
 1. IEEE format [12], APA (Norman, 2013)
5. Reflective writing - “Thinks” and argues +1

This week's tasks

1. **Diary – Deadline on Monday at 10 AM**
2. **Reading: Chapter 1 – until p. 36**
Fundamental Principles of Interaction, The System Image,
The Paradox of Technology, The Design Challenge
3. **Exercises**
 3. Morse code
4. **Project**
 1. Filter and develop initial ideas for Useful Products
(3 realistic ideas / team)

Arduino Exercises

Exercise	Description
01	Familiarize with Arduino UNO (LED Blink, digital and analog read serial) (→ Veera Ihalainen)
02	Libraries and Arduino variant (Teensy) (RGB LED, LCD display, servo, PWM) (→ Aleksu Zubkovski)
03	Morse code (algorithm, debugging, parallel computing) (→ Veera Ihalainen)
04	Sensor Experiment (accelerometer, digital thermometer, proximity sensor) (→ Veera Ihalainen)
05 (in progress)	3D-printing (modelling: Fusion 350, OpenScad or TinkerCad; printing: Ultimaker Cura) (→ Aleksu Zubkovski)
06 (in progress)	UART BUS (→ Antti Regelin)
07 (in progress)	I2C BUS (connecting two Arduinos together and communicating between boards) (→ Veera & Aleksu)
08	ESP32 (setting up; WiFi and Bluetooth exercises) (→ Include tinkerCAD and LCD exercise Antti Regelin)
09	Arduino IoT Cloud (minimal communication prototype - physical to web, web to physical) (→ Antti Regelin)