Project II

Hes·so VALAIS WALLIS
Haute Ecole d'Ingénierie
Hochschule für Ingenieurwissenschaften

Infotronics
Summerschool Project
2021

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HES-SO Valais, 2021

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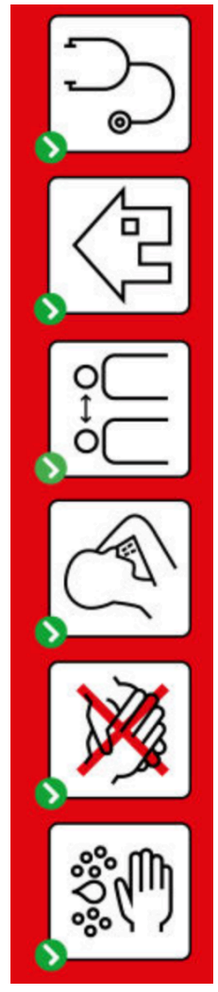
Rules

COVID-19

- Always wear a mask when you are in the theory room
- Always wear a mask when you are in the laboratory
- Always wear a mask when you are in the electronics office
- Clean your hands regularly by washing or disinfecting them
- Use two masks per day
- Throw used masks in the containers prepared for this purpose
- Avoid distances smaller than 1.5 meters without protection
- Do not use pencils and other tools of your group mates
- If you feel sick, stay at home. Inform the school. Make a test
- If you are not sure about something concerning COVID-19 ask an assistant or a teacher



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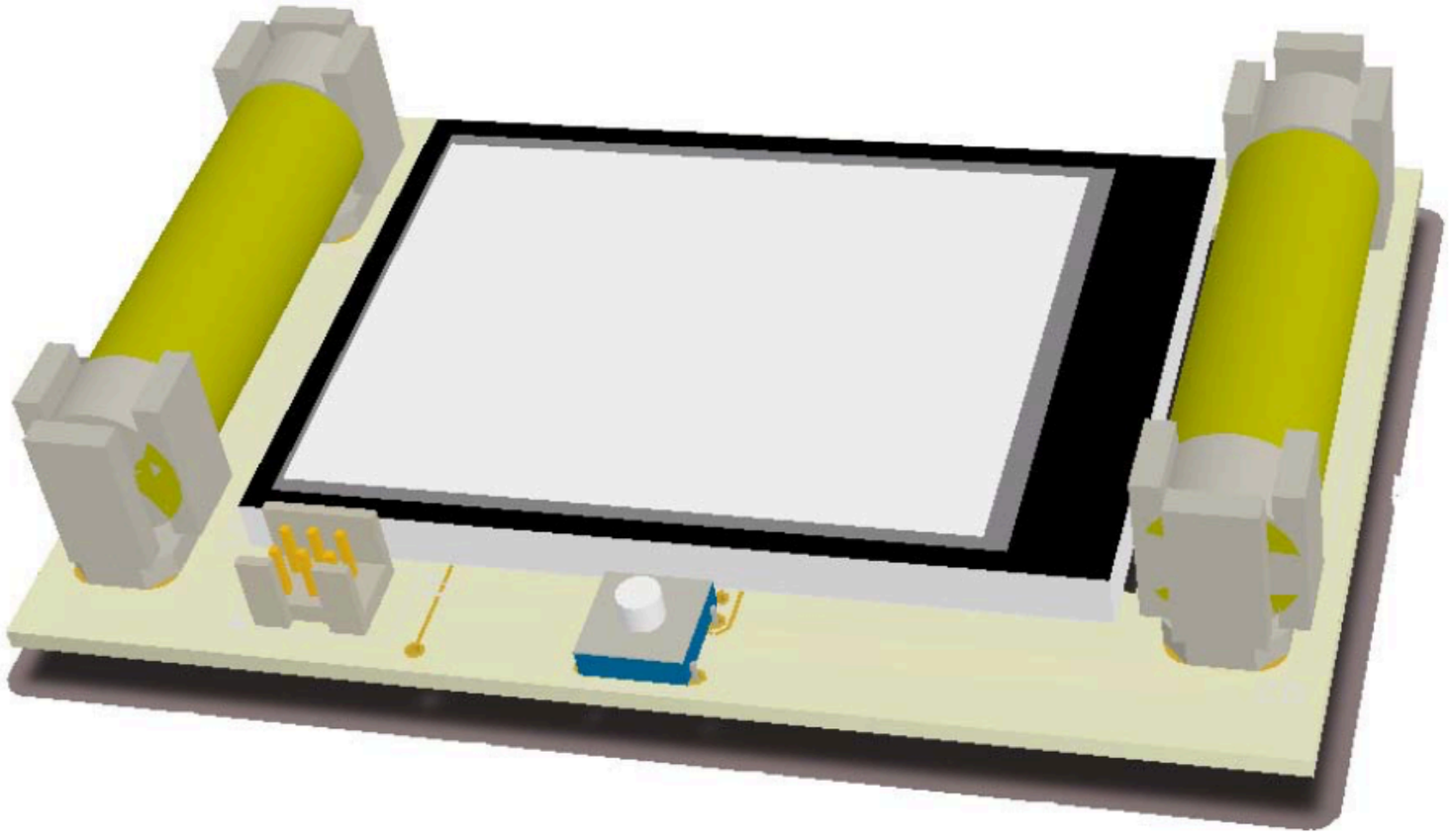
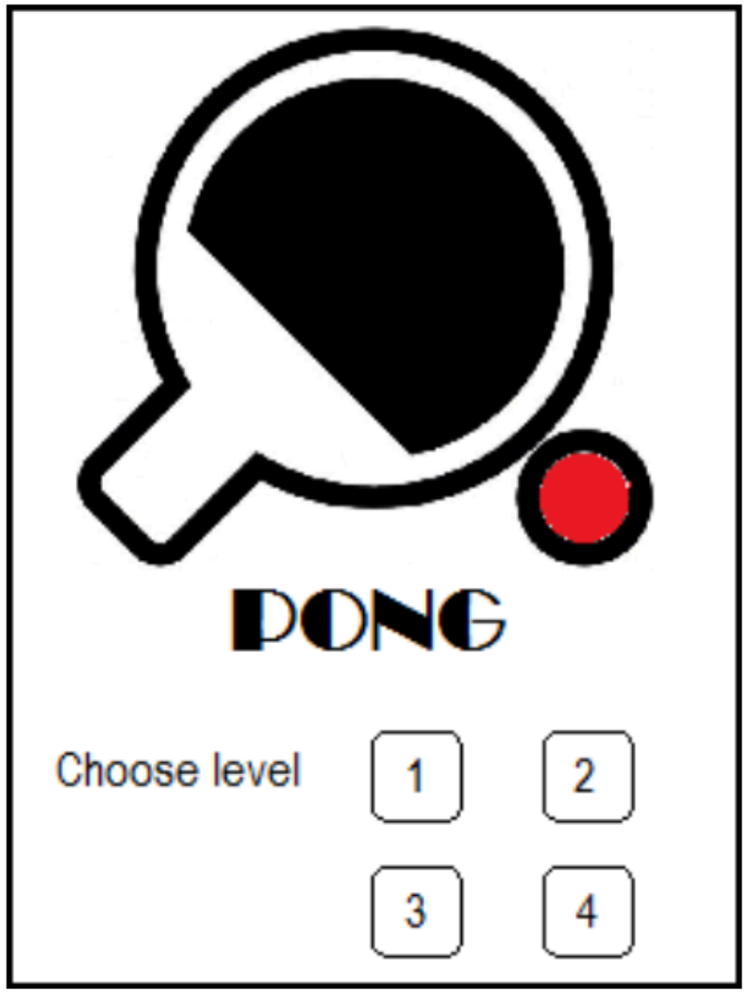
The Hardware

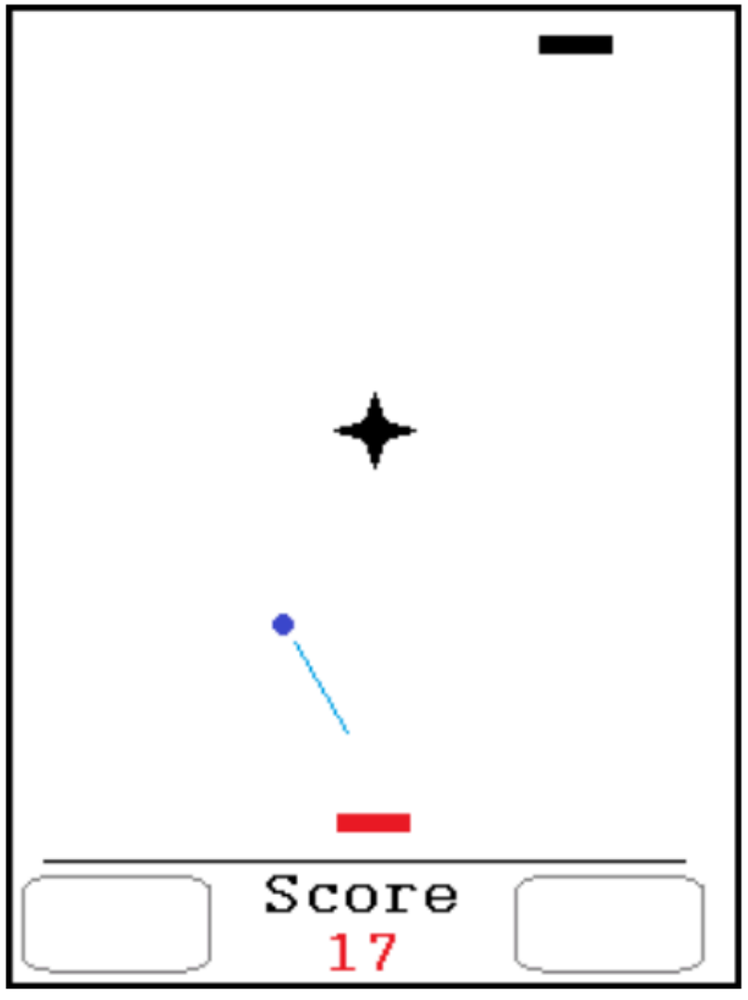
What you will do



The Software

What you will do





Tasks

What you will do

- Understand your task
- Draw schematic
- Design PCP
- Fabricate PCB
- Mount components
- Test hardware
- Design software
- Implement software
- Test Software
- Write technical report
- Present your work

Hardware

Constraints

- PIC microcontroller
- Display of type NHD-2.4-340320CF-CTXL#-FTN1
- Two AAA dry cells with metallic battery holders
- Debug connector either
  - CONNB2X3-2MM-FCI or
  - connector-less «TagConnect»
- All other components must be available form DISTRELEC

Software

Constraints

- Altium Designer for the schematic drawing
- Altium Designer for the PCB layout

- Umlet or PlantUML for the software design

- MPLAB X for the software implementation
- Programming language is C
- Compiler is XC8

- PDF is the format of the report artefact (you may use MS WORD or another text processor to generate it)
- PDF is the format of the presentation (you may use MS POWERPOINT or another presentation tool to generate it)

Report

Requirements

- Elements of the report :
  - Introduction
  - Product specification
  - Hardware architecture description
  - Description of the electrical schematic
  - Description of the software architecture (class diagrams)
  - Description of software functionalities (USE cases, sequence diagrams, state machines or activity charts)
  - Description des tests (you will be instructed how to do that)
  - Conclusion
- Additional documents (Attachments)
  - Bill of materials (supplier, price, quantity)
  - Altium Designer files
  - MPLAB X files
  - Test procedures and results of latter

Presentation

Requirements

- The presentation last 10 minutes
- The Q&A lasts 10 minutes
- Your product is tested by Pascal Sartoretti during the presentation
  - Functionality
  - Power consumption
- Each group member has to talk during an equivalent time
- Presentation criteria are
  - Quality of slides
  - Voice and attitude of the speaker
  - Completeness of the presentation
  - Timeliness of the presentation
  - Correctness and accuracy of your responses

How is your grade composed and calculated

Grading

- 20% Hardware of the developed product (HW)
- 20% Software of the developed product (SW)
- 20% Test procedures
- 20% Report
- 20% Presentation

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Week 1

Planning

Week I	Monday	Thuesday	Wednesday	Thursday	Friday
08:10-09:45	Introduction	Hardware block diagram, choice of additional components	Schematic drawing	PCB drawing (Place and route)	Introduction to embedded software engineering I
10:05-11:40	Study of mandatory components (datasheets)	Block diagram Validation	Schematic validation	PCB drawing (Place and route)	Components ordering
12:45-14:20	Hardware block diagram, choice of additional components (Mouser only)	Altium schematic refresh, touchScreen theory	Altium PCB refresh,	PCB manufacturing presentation	Bachelor work exposition
14:40-16:15		Schematic drawing	PCB drawing (Place and route)	PCB manufacturing, test software developement	

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Week 2

Planning

Week II	Monday	Thuesday	Wednesday	Thursday	Friday
08:10-09:45	PCB assembly presentation	PCB assemly and test	Introduction to embedded software engineering II	Software architecture validation	Software development
10:05-11:40					
12:45-14:20	PCB assembly and test			Software development	
14:40-16:15		PCB test and optimization	Software architecture (Use case and class diagrams)		

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Week 3

Planning

Week III	Monday	Thuesday	Wednesday	Thursday	Friday
08:10-09:45	Software validation	Hardware and software integration	Test validation	Finalize Documentation	Presentations
10:05-11:40			Testing		
12:45-14:20	Hardware and software integration	Test specification		Prepare presentation	Finalize Documentation
14:40-16:15					Project delivery

Q&A

Thank you for your attention

Your questions are welcome now

And remember :

Protect yourself and others !

Keep distance and wear a mask !