

SKILLS

CAD BIM MECHANICAL

- **Solidworks, Inventor, NX, Fusion360, SolidEdge, Mastercam** used on various projects involving **GD&T, FEA Analysis, sheet metal desing** and **plastic injection molding**
- **Inventor** and **SolidWorks** used to draft 2D engineering drawings with FAI dimensions
- List of components and BOM organization using **openbom**
- Design schematic drawings and their **PCBs** using **Eagle** and **OrCAD**
- Simpler **CAM** tasks for example **injection mold milling** on **3 axis mill**, programmed in **EdgeCAM, Mastercam, Solidworks**
- **ArchiCAD** and **Revit** used for creating **architectural** and **MEP/MEPF** models, using plans, **point cloud** or just and idea (exterior and interior as well)
- **Sketchup Pro** used to make a full modell and 3D floor plans with the help of **AutoCAD** 2D drawings
- Create interior and exterior **archviz** using **3DSMAX** and render with **V-Ray** or **Corona**, besides in **ArchiCAD** or **Revit** with **Twinmotion**, if not **Lumion**
- Used **Navisworks** for clash detection
- Used **RealWorks** and **ReCap** for working with point clouds
- **3D Printing, Laser Cutting** and **3 axis CNC mill** used to create custom designed parts
- Created 3D models based on **DFM/DFA** principles
- **Statistical tolerance analysis** used on tight tolerance assemblies
- Implemented **Root Cause Analysis, DFMEA** and mitigation plans to address design issues
- **High-volume** manufacturing methods used on many projects
- Made parts with **mill, lathe, drill press**, etc.
- Soldering, wiring **PCB** and welding metals (**MMA, MIG, TIG**)

EDUCATION

Budapest University of Technology and Economics

BSC student in Mechanical Engineering

Started in 2020 autumn semester, Full-time student

2016 - 2020 - Óbudai High School - high school diploma

Else

- English B2 Euroexam language exam
- Category "B" driving license
- ECDL exam
- HTML and CSS coding
- Adobe Creative Suite and Microsoft Office

PROJECTS

(two of my favorite projects, I made from idea to life)

REOIL

- Conversion from plastic waste to crude oil by cracking the polymers
- The crude oil made by this method is already sulfur and salts free, also it has way more aromatic hydrocarbons, this means a high octance number
- This oil can be refined more easily and contains dissolved gases in smaller quantity
- The process is self-sustainable and environmentally friendly
- OMV is also developing a similar machine

PULSEJET ENGINE

- This is the first air breathing jet engine ever developed for propulsion
- Robust, loud power machine, the valved type is more popular
- Modern days version is the PDE (Pulse Detonation Engine)
- Can work with both gas and liquid state propellant
- You need compressed air to kick start but there are self starting and even valveless versions

REOIL



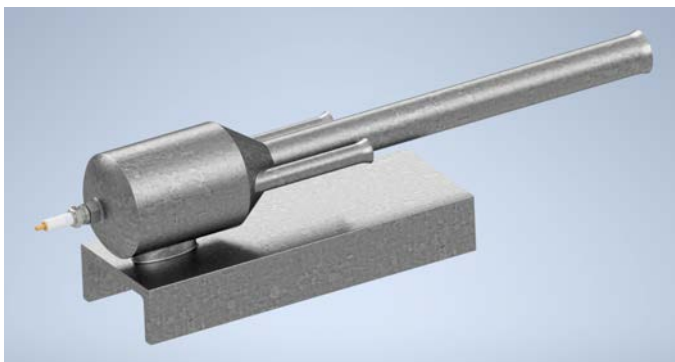
Designing

- Under continuous development
- Designed in Autodesk **Inventor**
- Used **FEA** and **CFD** simulations for design
- During construction I used chop saw, drill press, MMA and MIG welder

How?

- The starting material is most often the **PET** bottle's caps (**HDPE**)
- These caps are washed and shredded, then go inside the atmospherically isolated reaction chamber
- This reaction chamber is then heated with a gas burner, at this point the polymers start cracking into hydrocarbons via the pyrolysis
- Then the hydrocarbons are fed through two different catalytic cracking units
- Then these cracked short-chained hydrocarbons get distilled and collected

PULSEJET



What?

- This is a valveless pulsejet engine
- Special because works without any moving part
- The spark required for start is from car ignition system
- Runs on LPG

Results

- It is a working jet engine
- Deafening loud
- The thrust is equivalent to a hair dryer's thrust
- Consumes a lot of gas
- Can cook perfect sausage

ELECTRICAL PROJECTS

(DC motor controller for electric scooter and an induction heater)



About the scooter

- The scooter was bought on a scrap yard. The motor and its controller didn't work, so I took it apart and tried to repair. The motor voltage is 24VDC and has 500W of power. After cleaning and brush replacement the motor was perfect, but the controller couldn't be repaired.

Results

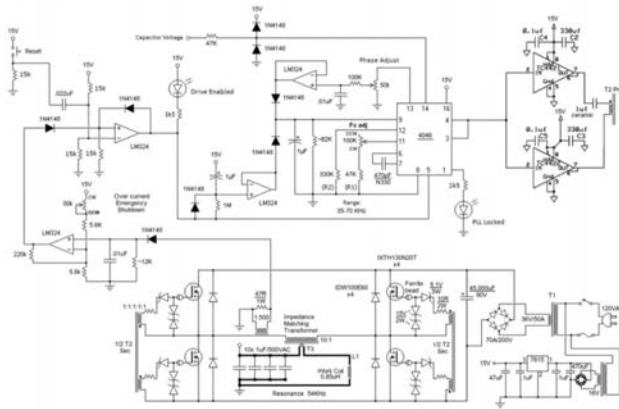
- I wanted a motor controller which can be throttled by a potentiometer, for my beloved scooter, because this was the easiest and most cost-effective solution
- From the designs I found on the internet, I made a 555 timer IC based mid frequency, PWM motor controller with MOSFET driver **schematics**, using **Altium** and designed a **PCB** for it in **EAGLE**
- After soldering everything together and wiring, it worked perfectly

About the induction heater

- I chose the most sympathetic schematics found on the internet, this was the starting point. I redesigned this schematics according to my own needs (frequency, power, material to be heated, available elements, etc.)
- Altium** used for schematics, **EAGLE** used for PCB

Results

- Well-functioning induction heater which is even capable for driving a DRSSTC primer
- Self-tuning, Full bridge, PLL device (CD4046 IC based) so there is no need for oscilloscope
- As long as it worked, heated iron and aluminium to melting
- IGBTs were destroyed due to carelessness for overvoltage



PROFESSIONAL EXPERIENCE

INVA Építésziroda Kft.

- Architect intern position
- More than **700** worked hours
- BIM** work environment
- MEP/MEPF** modelling in **Revit** software alone, and with **SysQue** as well
- Clash detection** using **Navisworks**
- Sub** and **Superstructure** modelling using **Revit**
- Interior/Exterior** modelling using **Sketchup Pro** software then archviz render with **Chaos V-Ray**
- Furniture modelling or optimize existing furniture families using **Sketchup Pro**
- ArchiCAD** used for **point cloud** projects
- Point cloud optimizing and navigation using **ReCap** and **RealWorks**
- The projects I worked on were at **LOD350** and **LOD400** detail level