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YİĞİT GÜNSÜR ELMACIOĞLU

Senior Mechanical Engineering and Physics Student

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LANGUAGES

English: TOEFL IBT: 104/120
French: Upper Intermediate
Italian: Beginner
Turkish: Native

COMPUTER SKILLS

C++ | Python | Solidworks | MATLAB | Simulink | ROS | ANSYS Mechanical | LaTeX | C | HTML/CSS | Blender | ANSYS Fluent | Inkscape | Microsoft Office

STUDY ABROAD

Universite de Lorraine

July – Aug 2014

Nancy, FRANCE

- Summer University Courses for Foreign Students

Institut Lyonnais

July – Aug 2013

Lyon, FRANCE

- Certificate of French Studies

INTERESTS

Aerospace | Aeronautics | R&D | Simulation | Physics | CAD | Modelling | Robotics | Problem Solving

EDUCATION

Boğaziçi University | Mechanical Engineering | Physics (Double Major Program)

September 2017 – Present — İstanbul, TURKEY

- **GPA:** 3.90/4.00
- **Activities:** BUMERANG Rocket Team | RASAT CanSat Team | BUSTLab
- Top student in the Department of Mechanical Engineering
- TUBİTAK 2205 Scholarship Undergraduate Scholarship for Science Student
- 0.02% in Nation-wide University Placement Exam in Maths & Sciences

Galatasaray High School

September 2012 – June 2017 — İstanbul, TURKEY

- **GPA:** 87.59/100
- **Activities:** Volleyball Team Captain | Guitarist at student band | Art Club Member
- 0.02% in Nation-wide High School Placement Exam
- Equivalent to French Baccalauréat

PROJECTS

**for more details check my personal website*

Magnetically Actuated Guidewire Design for MRI Scanners

June 2022 - Present

- Under the supervision of Prof. Metin Sitti and Mehmet Efe Tiryaki, I designed an actuation mechanism for guidewires using the permanent magnetic field of MRI. The Cosserat rod model is used for soft body mechanics simulation in C++ and ROS with magnetic force and moments. VSM is extensively used to investigate the continuous magnetization of the permanent magnet in high magnetic fields (B>0.5T).
- **PUBLICATION:** M. Efe Tiryaki, Yigit G. Elmacioglu, Metin Sitti, ***Magnetic Guidewire Steering at Ultrahigh Magnetic Field***, Submitted

Numerical Simulation of Particle Trajectories in Ion Thruster Grid Region Plasma using a PIC-DSMC Code

January 2022 - Present

- I am working with Prof. Murat Çelik on the Simulation of an Ion thruster grid region using an in-house written plasma physics code in C++. Iterative GMRES and Eigen solvers are used to compute potential values from Poisson's equation. The probabilistic Monte Carlo technique is used for collisions, initial position, and velocity assignments.

Weight Compensation Mechanism for an Elastic Metamaterial

October 2021 – June 2022

- As the senior design project, I worked with Prof. Çetin Yılmaz on a weight compensation mechanism for an elastic metamaterial that uses inertial amplification to generate low-frequency band gaps.

Compressor, Overdrive and Delay Effect Pedals

March 2022 - June 2022

- Starting with the schematic of classic effect pedals for electric guitar, the sound difference created by each component such as capacitor, op-amp, OTA, diode, and transistor is observed. Additionally, soldering and various manufacturing techniques are practiced.

Tic Tac Toe Player CNC Pen Plotter |

Oct 2020 – Jan 2021

- As the term project of ME331-Mechatronics course, with a group of 6 people, we built a CNC Pen Plotter which uses Image Processing. I was in charge of the construction and electronics of the machine as well as testing the Python code.

Design and Analysis of Model Satellite |

Dec 2020 – March 2021

- As the leader of the mechanical group of the RASAT CanSat team, I worked on structural parts of the satellite design which involves a controlled landing mechanism.

3DOF Simulation of Model Rocket |

Apr 2021 – May 2021

- As a member of the Bumerang Rocket Team for TeknoFest, I wrote a MATLAB code to simulate and visualize 10 000ft altitude rocket trajectory considering changing atmospheric conditions and aerodynamic coefficients.

EXPERIENCE

BUSTLab | Undergraduate Researcher

Oct 2021 – Present — İstanbul, Turkey

- Currently working with Prof. Murat Çelik at Boğaziçi University Space Technologies Laboratory on Plasma Modelling. Additionally, I've extensively researched flight mechanics and created a 6DOF simulation for a plane using MATLAB/Simulink and Flight Gear.

Max Planck Institute for Intelligent Systems | Undergraduate Researcher

June 2022 – Sep 2022 — Stuttgart, Germany

- Worked on a magnetic actuation mechanism via MRI for guidewires to be used in medical applications. Supervised by Prof. Metin Sitti and Mehmet Efe Tiryaki

PAKKENS | Internship on Manufacturing

Jan 2022 – Feb 2022 — Bursa, Turkey

- Investigated different manufacturing methods ranging from machining to injection molding. Also contributed to R&D projects on flow simulation of a hydro block of a combi boiler.

BAYKAR Technologies | Mechanical Engineering Intern

Aug 2021 – Sep 2021 — İstanbul, TURKEY

- CFD Store Separation Analysis from an unmanned aircraft under the effect of propeller for various types of store geometries
- Research on Guidance, Navigation, and Control of a missile and basic programming applications of different Guidance Laws

Atölye Eğitim | Student Assistant

Sep 2017 – Dec 2018 — İstanbul, TURKEY

- Conducted one-to-one physics and mathematics classes for senior high-school students preparing for national exams (LYS-YGS for entering college). Also gave problem sessions and prepared videos for solutions to the weekly exams