

# Tunay TURK

Graduate Teaching and Research Assistant – Missouri University of Science and Technology  
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## EDUCATION

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**Missouri University of Science and Technology** Rolla, Missouri, USA  
*Doctor of Philosophy in Mechanical Engineering* ongoing  
Research Topic : “Laser Foil Printing”  
Advisor : Prof. Dr. Ming C. LEU

**Middle East Technical University** Ankara, TURKEY  
*Master of Science in Mechanical Engineering* 2018  
Dissertation: “Investigating the Effects of Man-Portable Launcher on the Operator with the use of Anthropomorphic Test Device”  
Advisor : Prof. Dr. Metin AKKÖK  
Co-Advisor : Assoc. Prof. Dr. Volkan ESAT  
C.GPA : 3.07/4.00

**Middle East Technical University** Ankara, TURKEY  
*Bachelor of Science in Mechanical Engineering* 2013  
Graduation Project: “Design of a Bearing-Free Antenna Pointing Mechanism for a Satellite System”  
C.GPA : 3.10/4.00

## EXPERIENCE

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**Missouri University of Science and Technology** Rolla, Missouri, USA  
*Graduate Teaching Assistant* 01/2021 – ongoing  
Mechanical Engineering Department  
ME 4761 – Engineering Design (Senior Design Course)

**Missouri University of Science and Technology** Rolla, Missouri, USA  
*Graduate Research Assistant* 08/2020 – ongoing  
Mechanical Engineering Department  
Innovative Smart & Additive Manufacturing (ISAM) Laboratory

**ROKETSAN Missiles Inc.**

Ankara, TURKEY

*Specialist Mechanical Design Engineer*

01/2018 – 04/2020

Tactical Missiles Unit Head

System Test and Platform Integration Department

Mechanical Sub-Systems Team

**ROKETSAN Missiles Inc.**

Ankara, TURKEY

*Mechanical Design Engineer*

12/2013 – 01/2018

Tactical Missiles Unit Head

System Test and Platform Integration Department

Mechanical Sub-Systems Team

Job Description:

- Research, Development, Design, Analysis, Production and Verification of Missile Launcher and Pod Systems for ground, naval and air platforms made up of metal, plastic and composite materials with respect to US Military Standards.
- 3-D Mechanical Design of the Missile Launcher and Pod Systems employing CATIA V5/V6 PLM Software and Technical Data Package Development.
- Structural Implicit and Explicit Finite Element Analyses of the Missile Launcher and Pod Systems with ANSYS 18 with respect to the predefined requirements.
- Military Environmental Testing and validating the structural and functional integrity of the manufactured prototype of Missile Launcher and Pod Systems.
- Documentation of the duties defined above.

Expertise:

- Computer Aided Design and Engineering (CAD & CAE)
- Geometric Dimensioning and Tolerancing (GD&T)
- Finite Element Analysis of Metal, Plastic and Composite Structures (FEA)
- Material Testing, Characterization and Selection
- System Verification and Validation via Environmental Testing (MIL-STD-810G)

**PROJECTS**

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**Man-Portable Missile System**

2015-2020

*Separable Gripstock Mechanical Design Responsible*

- Human-machine interaction user safe system mechanical design and ergonomics analysis. (MIL-STD-1472G)
- Lightweight and high strength material selection (carbon fiber reinforced thermoplastic composite material), material characterization, manufacturability and prototype generation.
- Structural FE Analyses and Verification activities.

## **The Researcher Training Program for Defense Industry (SAYP)**

2015-2018

*Researcher*

“Investigating the Effects of Man-Portable Launcher on the Operator with the use of Anthropomorphic Test Device”

- Master’s thesis and graduate studies/education were completed with respect to the signed protocol between METU, ROKETSAN and the Presidency of Defense Industries (SSB) of Turkey.
- The project was completed successfully with the sponsorship and supervision of SSB.
- Experimental data was obtained from the missile launching tests of ROKETSAN products and all possible effects were analyzed with respect to FE Analyses and literature data.
- Potential hazardous effects of high temperature, noise, toxic gas and force/acceleration were investigated.

## **UMTAS Long Range Anti-Tank Missile System**

2013-2016

*Launcher System Mechanical Design Responsible*

- Mechanical design, Structural FE Analysis, Production, Prototype Generation, Test Verification and Documentation.
- Verification duties including Hot-Cold Environment, Thermal Shock, Vibration (Transportation and Captive Carry), Humidity, Salty Fog, Sand/Dust, Rain Tests Participation and Coordination. The effects of severe environmental conditions were experienced. (MIL-STD-810G)
- Some pop-up and urgent needs of air/naval/land platform integration activities were completed.

## **Mechanical Engineering Senior Design Project (BS)**

2013

*Team Leader*

“Design of a Bearing-Free Antenna Pointing Mechanism for a Satellite System”

- Research on Space systems and requirements, concept generation, calculation of mechanical parts, selection of electric motor, structural FE analysis, and prototype production.
- Project was completed with the sponsorship and the supervision of TUBITAK-UZAY (TUBITAK Space Technologies Research Institute).
- The project team was leaded. I was an interface between the team and the advisor professor.

## **Wind Energy and Turbine Technologies Term Project**

2012

*Team Member*

“Design and build a prototype model Magnus Effect Wind Turbine Rotor”

- Research on Magnus Effect Wind Turbines, calculation of rotor diameter and blade size/diameter, mechanical design and calculations of rotor including gear pairs and main structure, prototype production.

## RESEARCH EXPERIENCE

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### Laser Foil Printing

2020-ongoing

- Laser foil printing is a novel method for laser aided metal additive manufacturing that was developed in Missouri University of Science and Technology. This technology is my primary research topic for my research in Missouri University of Science and Technology.

### Leaf Spring Life Analysis

2016-2018

- Geometric optimization, different steel grades were compared, and FE model generated. Possible cycle number for failure was determined.

### Thermoplastic Composite Material Selection and Characterization

2015-2016

- Tensile testing of different materials was completed, and the values were compared. (Glass-fiber and carbon fiber reinforced PA, PPA, and PEEK etc.) After the potential material number was decreased to three, some high temperature, low temperature, and humidity effects on tensile strength of materials were investigated. Low weight-high strength material was selected, and creep and relaxation data were reached from laboratory experiments in order to construct the viscoelastic material model.

### Investigation of the corrosion performance on salty fog environment for different steel materials and coatings

2014-2016

- Product samples from several fastener manufacturers and their several material grades were studied in-depth. Corrosion resistances of different steel fastener materials (with several coating variations) were compared, and an important know-how was obtained.

## COMPUTER SKILLS

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### Design Software

NX

SOLIDWORKS

CATIA 3D EXPERIENCE

CATIA V6 PLM-Enovia

CATIA V5

KeyCreator-Kubotek3D  
(CADKEY)

### FEM Software

Abaqus CAE

ANSYS 18

MSC SimXpert

ANSA

### Other Software

MATLAB

PTC Mathcad

Microsoft Office (Microsoft  
Word/Excel/PowerPoint/  
Project)

IBM Rational DOORS

LaserDESK

## LANGUAGE SKILLS

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### Languages

Turkish : Native

English : Fluent

German : B1 (06/2018 – Goethe Institute Ankara)

## EXAM RESULTS

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### Examinations

SPEAK Test : 50 (Test Date: Dec. 4<sup>th</sup>, 2020)  
TOEFL IBT : 94 (Test Date: Nov. 9<sup>th</sup>, 2019) (Read:24, List:25, Spea:22, Writ:23)  
GRE General Test : 144 Verbal, 170 Quantitative, 3.0 Academic Writing  
(Test Date: Oct. 10<sup>th</sup>, 2019)

## INTERNSHIPS

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**Bosch San. Tic. A.S.** Bursa, TURKEY

*Intern Mechanical Engineer* 06/2012-07/2012

Gasoline Systems, HDEV5 Type Gasoline Injector Production Plant.

- During the internship period, business development project of “Reduction of the number of falling parts at non-automated HDEV5 Production Plant” was successfully completed.

**Oyak-Renault A.S.** Bursa, TURKEY

*Intern Mechanical Engineer* 07/2011-09/2011

Chassis Department Machining Workshop.

- During the internship period, business development project of “Application of 5S Methodology to the Rear Brake Disc Production Line” was successfully completed.

## PUBLICATIONS

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### Theses

- 1) **M.S. Thesis**, *Investigating the Effects of Man-Portable Launcher on the Operator with the use of Anthropomorphic Test Device*, Department of Mechanical Engineering, Middle East Technical University, Ankara, TURKEY, Aug. 2018.

### Journal Papers

- 1) “Development and experimental study of an automated laser-foil-printing additive manufacturing system,” C-H. Hung, **T. Turk**, M. H. Sehhat and M. C. Leu, **CIRP Annals – Manufacturing Technology** (under review)