

# Berkay Kuşkura

## Aerospace Structural Analyst · Fatigue & Damage Tolerance Lead

berkaykuskira@gmail.com · +90 538 983 78 44 · linkedin.com/in/berkaykuskira · kuskira.com · Ankara, Turkey



### PROFILE

---

Lead Structural Analysis Engineer at Turkish Aerospace Industries (TAI) with 8+ years substantiating metallic and composite aerospace primary structure. Current scope spans AI-assisted method-and-tool development for the stress organisation and Fatigue & Damage Tolerance ownership on a fighter-jet programme. Track record includes EASA CS-23 certification on the Hürkuş trainer (forward fuselage, rudder), GFEM-driven sizing across fighter-jet primary structure, and preliminary landing-gear and e-VTOL structural studies. Authors release-level stress reports, drives slow-crack-growth and fail-safe assessments, and closes non-conformances across loads, design and test interfaces.

### EXPERIENCE

---

#### Method & Tool Development Engineer

Oct 2025 — Present · concurrent

Turkish Aerospace Industries (TAI) · Ankara, Turkey

- Develop AI-assisted internal tooling that automates repetitive stress-analysis workflows and scales analyst throughput across the organisation.
- Build machine-learning surrogate models that approximate expensive FE evaluations, enabling rapid sizing trades and design-space exploration.
- Use LLM-based code generation and agentic workflows to accelerate Python tooling, Nastran/Abaqus parser development and stress-report automation.

#### Fatigue & Damage Tolerance Engineer

Aug 2021 — Present

Turkish Aerospace Industries (TAI) · Ankara, Turkey

- Lead the Durability & Damage Tolerance (DaDT) workpackage on primary metallic and composite airframe structure of a next-generation fighter platform.
- Own the DaDT analysis chain — GFEM internal-load extraction, detailed sub-models, fatigue spectra application, crack-growth assessment, and inspection-interval setting.
- Author and release DaDT stress reports for fracture-critical and durability-critical parts with formal revision control and design-office sign-off.
- Substantiate joints, cut-outs, fillets, fastener load transfer and complex feature stress concentrations through detailed FE modelling and classical hand-calc methods.
- Extract DaDT allowables for multiple material and configuration cases and feed them into the GFEM-based global sizing loop.

#### Structural Analysis Engineer

Sep 2017 — Aug 2021

Turkish Aerospace Industries (TAI) · Istanbul, Turkey

- Hürkuş Trainer — substantiated metallic and composite primary structure on the Hürkuş-B forward fuselage and Hürkuş-C rudder against EASA CS-23 requirements.
- Hürkuş-B — authored the forward-fuselage certification stress report and closed authority and internal review comments through release.
- Hürkuş-C — led the rudder weight-reduction study via composite lay-up resizing and hinge re-design while preserving reserve-factor compliance.
- e-VTOL Cargo Concept — drove conceptual structural sizing (load-path layout, primary-mass estimation, material down-selection) for an e-VTOL military cargo platform.

#### Project Student & Intern

Jul 2016 — Jun 2017

TEI — TUSAŞ Engine Industries · Eskişehir, Turkey

- Undergraduate research on a gas-turbine-engine curvic coupling — parametric FE study of tooth-flank stress and contact pressure under various load cases (B.Sc. thesis).

### EDUCATION

---

## M.Sc. in Solid Mechanics

Feb 2018 — Jul 2022

Istanbul Technical University · Istanbul, Turkey · GPA 3.69 / 4.00

Thesis: *Optimization of CFRP Prepreg Composite Rim by Using MOGA-II Genetic Algorithm*

## B.Sc. in Mechanical Engineering — Specialty: Structure

2012 — 2017

Yıldız Technical University · Istanbul, Turkey · GPA 3.55 / 4.00

Thesis: *Behavior of a Gas Turbine Engine Curvic Coupling Parameters Under Various Loads · TEI undergraduate research*

## Erasmus+ Exchange — Mechanical Engineering

2015 — 2016

Brno University of Technology · Brno, Czech Republic

## SKILLS

---

<b>Analysis &amp; Substantiation</b>	Durability & Damage Tolerance (DaDT) · Slow Crack Growth & Fail-Safe Analysis · Fatigue Spectrum Application · Static, Stability & Buckling Analysis · GFEM Load Extraction & Sub-modelling · Composite Strength & Stability · Bolted-Joint & Lug Analysis (Hand Calcs)
<b>FEA Solvers &amp; Pre/Post</b>	MSC Nastran · Abaqus · ANSYS Mechanical · MSC Patran · Altair HyperMesh · CATIA V5
<b>Standards &amp; Compliance</b>	EASA CS-23 / FAR Part 23 awareness · CS-25 / FAR 25.571 awareness · Certification stress reporting · Test-analysis correlation
<b>Programming &amp; Automation</b>	Python scientific stack (NumPy, SciPy, pandas, Matplotlib) · pyNastran — Nastran deck & result parsing · Abaqus Python scripting · Femap API / PCL (Patran Command Language) · HyperMesh Tcl/Tk scripting · Nastran DMAP & bulk-data automation · Git version control
<b>AI, ML &amp; Optimisation</b>	ML surrogate models for FE acceleration · Multi-objective optimisation (MOGA-II, NSGA-II, pymoo) · scikit-learn — regression & life-prediction models · LLM-assisted development & agentic tooling · Design of Experiments (DoE) & response surfaces
<b>Engineering Leadership</b>	DaDT workpackage lead — planning & review · Mentoring of junior stress engineers · Stress-report authoring & release control · Design-review representation (PDR / CDR) · Cross-team coordination — Loads, Design, Test, Manufacturing

## LANGUAGES

---

**Turkish** — Native · **English** — Professional working proficiency (C1)