

Roham Maher

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PROFESSIONAL SUMMARY

Structural/Stress Engineer with **10+ years** of experience in **finite element modeling (FEM)**, **CAD design**, and **structural integrity assessments**. Led engineering analysis for railway vehicles, achieving **70%+ cost savings** and **third-party certification without physical testing**. Expertise in **fatigue life enhancement**, **crashworthiness**, and compliance with **EN, JIS, VDI standards**. Proficient in **validated simulation models**, **supplier collaboration**, and **technical documentation** to support manufacturing and approval processes.

WORK EXPERIENCE

- **Head of Structural and Stress Analysis Engineering | TWM Co.** (2019–2025)
 - Led **structural design** and **finite element analysis (FEA)** for **metro and freight wagons**, ensuring compliance with **EN, JIS, VDI**, and **DVS codes** to guarantee **structural integrity** and **safety**.
 - Upgraded metro **carbody classification** from **PIV to PIII (EN 12663)**, eliminating **physical testing** and reducing **project costs** by **over 70%**, while enabling **third-party (EC-Engineer) qualification**.
 - Managed **CAD** and **FEA workflows** for **bogies (EN 13749)**, **carbody structures**, and critical parts (battery boxes, gangways, rail guards), facilitating **external validation**.
 - Directed over **30 major deliverables**; collaborated with **20+ Design Approval Documents (DADs)** and **third-party consultants** to achieve **100% manufacturing approval**.
 - Achieved over **80% cost savings** by eliminating prototype-stage tests through **advanced virtual modeling and optimization**.
 - Solved critical **fatigue failures** (e.g., **rail guard cracking**), co-led **design modifications** that extended **component service life by 60%**.
 - Reviewed and confirmed **static, fatigue, crashworthiness**, and **modal assessments** for the **EPC contract of 630 metro wagons**, ensuring **certification readiness**.
 - Directed **structural testing** and **substantiated FEA models** of newly designed gangways (**EN 16286**), achieving **certification without re-testing** and **reducing costs by 40%**.
 - Optimized **material selection** to meet **strength** and **durability criteria**, enhancing component **lifespan** and **reliability**.
 - Delivered **technical documentation** and **specification reports** to support **engineering decisions** and ensure **compliance**. These documents emphasized analysis of vehicles and components according to relevant standards, especially **“EN” standards**, verified through **third-party certification**.
 - Published and presented **peer-reviewed papers** on **carbody refinement**, **fatigue life improvement**, and **structural reliability** at **international conferences** and **exhibitions**.

- **CAE Engineer | Freelance** (2017–2019)
 - **University of Hertfordshire (UK)**
 - ✓ Investigated **seismic cyclic behavior** of **H-shaped stainless-steel columns** using **FEA**, **Taguchi DOE**, and **ANN**, identified critical **axial load effects** supporting updates to **seismic design revisions**.
 - ✓ Modeled **post-fire cyclic performance** of **steel beam–column joints** using corroborated **Ansys simulations** (less than 4% error), used **Taguchi** and **ANN** to highlight **fire temperature** as the main factor; demonstrated superior resilience of **duplex stainless steel** up to **800 °C**.
 - **PantoHealth (Germany)** – Developed a **predictive method** for pantograph **defects** using **acceleration data**, cutting **emergency maintenance** by **50%** and extending inspection **cycles**.
 - **NEX POWER LTD (UK)** – Engineered and optimized **gyroplane engine frame**, achieving **18% weight reduction** and **22% stiffness increase**, accelerating **testing by 3 months**.
 - Conducted experimental and numerical investigations on high-strain rate behavior of lightweight sandwich panels with aluminum corrugated cores and smart composite facesheets; impact tests showed **20% greater energy absorption** than traditional designs.

- **CAE Engineer | Shabih Sazan Sharif Co. (2015–2017)**
 - Conducted FEA simulations on composite structures under static and time-dependent loads, **reducing prototype development time by 30%** through virtual validation and optimization.
- **Senior Mechanical Designer | FarsRig Co. (2013–2015)**
 - Crafted **drilling machines** using **3D CAD**, **improving efficiency and performance**; reduced **costs** by **redesigning and reorganizing vehicle parts** for **in-house manufacturing and procurement optimization**.

SKILLS & TECHNICAL EXPERTISE

- **Specialized Engineering Knowledge**
 - R&D (Research & Development) | Material test, selection, and simulation | Technical Specification | Documentation | V&V (Verification & Validation) | Standards Compliance | DCC | Six Sigma Green Belt | FMEA (DFMEA/PFMEA) | GD&T
- **Simulation & Structural Analysis expertise**
 - **Finite Element Analysis:** Static | Thermal | Fatigue | Fracture | Impact | Blast | Vibration | Rigid-Dynamic | Buckling | Fluid-Solid Interaction (FSI) | Seismic design | Pushover
 - **Optimization Techniques:** Deterministic & Probabilistic Approaches
 - **Material Investigation:** Composite | Smart Materials | Steel | Aluminum | Plastic | HyperElastic | Concrete
- **Software & Tools**
 - **FEA & Optimization:** ANSYS | FEMAP | LS-Dyna | Autodyn | Optislang | SimSolid
 - **Fatigue Analysis:** MSC Fatigue | Ncode Design
 - **Offshore Analysis:** SACS Offshore Structure | ANSYS Aqwa
 - **Weld & Bolt Analysis:** SimuFact | mDesign
 - **CAD & 3D Modeling:** CATIA | Siemens NX | SpaceClaim
 - **Project managing:** Minitab | Minitab companion |
- **Interpersonal and Organizational Skills**
 - **Guiding teams toward objectives & Collaboration:** Collaborative approach | Clear communication across departments
 - **Effective Issue Resolution & Innovation:** Critical reasoning | Innovative thinking | Flexibility in changing environments
 - **Project Execution:** Efficient Prioritization and Scheduling | Coordinating Timelines and Deliverables

EDUCATION

- **MSc, Solid Mechanics Engineering** | Isfahan University of Technology (2012–2014)
- **BSc, Solid Mechanics Engineering** | Azad University, Science & Research Branch (2005-2011)

CERTIFICATIONS

- **ANSYS (Numesys | ANSYS Elite Channel Partner)**
 - SpaceClaim | ANSYS Mechanical | ANSYS Mechanical Structural Nonlinearities | ANSYS Mechanical Linear and Nonlinear Dynamics | LS-DYNA | ANSYS Composite Prepost | nCode DesignLife | Workbench Additive
- **Fatigue Analysis and Life Estimation of Industrial Components (Ontario Technologist House)**
- **Catia (Tehran institute of technology)**
 - Elementary courses | Advanced courses

LANGUAGES

- **English** – Fluency

REFERENCES & RECOMMENDATIONS

References and Recommendations from European companies and university are available upon request.