

FAISAL UR REHMAN

Structural Engineer | Numerical Modelling & Simulation | Nonlinear Analysis | Scientific Computing & Engineering Software

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PROFILE

Structural engineer, computational modeller, and Assistant Professor at UET Peshawar with 20+ years of experience spanning structural analysis, numerical simulation, scientific programming, and engineering education. Research focuses on the nonlinear behaviour and seismic performance of masonry and adobe structures using finite- and discrete-element approaches and open-source tools. Experienced in nonlinear static and dynamic analysis, constitutive and material modelling, model verification, and engineering interpretation using OpenSees/OpenSeesPy, SAP2000, Abaqus, Ansys, Code_Aster, FEniCS, OOFEM, CalculiX, Python, MATLAB, and C/C++. Applied these capabilities to masonry buildings, reinforced-concrete structures and bridge piers, blast-load assessment, and city-scale exposure studies. Registered Engineer (PEC) who also develops rapid-assessment, BIM, GIS, AI, and data-capture software that converts field and test inputs into traceable engineering workflows.

CORE COMPETENCIES

- Nonlinear finite-element and discrete-element modelling
- Nonlinear static, dynamic, and seismic analysis
- Constitutive and material model implementation and calibration
- Masonry, adobe, and reinforced-concrete structural simulation
- Model verification, sensitivity studies, and performance interpretation
- Scientific programming: Python, MATLAB, and C/C++
- Open-source and commercial structural-analysis solvers
- HPC, GIS, and city-scale computational workflows
- Engineering software, automation, agentic AI, and BIM
- Field and test-data integration for rapid-assessment workflows

SELECTED MODELLING, SIMULATION & ENGINEERING SOFTWARE PROJECTS

- Masonry and adobe modelling: PhD research on numerical analysis and seismic performance of masonry structures using open-source tools; M.S. thesis modelled brick masonry using the Discrete Element Method.
- Nonlinear structural simulation: developed OpenSees/OpenSeesPy, Python, and commercial-solver workflows for nonlinear static and dynamic analysis, constitutive modelling, verification, and interpretation.
- Professional analysis and vetting: SAP2000/AEM work for Fazle Haq Degree College, a suspension-bridge pier, the Pearl Continental Hotel road-blocker and blast-load assessment, and a 512-flat G+3 brick-masonry housing project for PWWF in Faisalabad.
- HPC and city-scale assessment: built C/C++/Python workflows on Frontera (TACC) during the NHERI/SimCenter Summer Bootcamp and used GIS/satellite data for large-scale structural exposure studies.
- Rapid-assessment software: designed cross-platform workflows for structured field observations, NDT/test-data capture, validation, audit trails, risk summaries, and automated engineering reports.
- Engineering automation and AI: developed civil.builders and enggprog.com, automated Excel/SAP2000/AutoCAD workflows, supervised an award-winning AI project-management FYP, and is developing agentic BIM solutions.

ACADEMIC & PROFESSIONAL EXPERIENCE

Assistant Professor, Civil Engineering – University of Engineering & Technology (UET), Peshawar

2013–Present

- Teach and lead labs in programming and civil engineering computing (MATLAB/Python), structural-analysis software, GIS/RS, mechanics of solids, and project management.
- Supervise capstone projects and applied research in numerical structural modelling, masonry behaviour, BIM/AI, and engineering software development.
- Develop computational examples, reusable software tools, and digital assessment systems that improve reproducibility, transparency, and learning outcomes.

Lecturer, Civil Engineering – University of Engineering & Technology (UET), Peshawar

2005–2013

- Delivered undergraduate instruction across core civil engineering subjects and computing, introducing practical programming and software-based analysis for civil engineers.
- Supported departmental administration and has served as Semester Coordinator from 2005 to the present.

EDUCATION

- PhD in Structural Engineering (in progress), UET Peshawar — Research: Numerical Analysis of Masonry Structures with Application to Adobe Masonry Using Open-Source Software.
- M.S. in Structural Engineering, UET Peshawar (2012) — Thesis: Analysis of Brick Masonry Using the Discrete Element Method.
- B.S. in Civil Engineering, UET Peshawar (2005).

SPECIALIZED TRAINING & CERTIFICATIONS

- OpenSees training in nonlinear analysis of reinforced-concrete structures; OOFEM.ORG training in Salome-Meca pre/post-processing, numerical simulation, and custom material models.
- NHERI/SimCenter Summer Bootcamp: C/C++/Python workflows on Frontera (TACC), computational modelling, and GIS/satellite-based city-scale assessment.
- DeepLearning.AI and Coursera certifications in programming, AI/ML foundations, data analysis, and engineering automation; Microsoft Certified Systems Engineer (MCSE).
- HEC training in teaching methodology and Mathematica; additional project-management training through Udemy and Coursera.

TECHNICAL SKILLS

Methods:	Nonlinear static and dynamic analysis; FEM, DEM, and AEM; seismic response; constitutive/material modelling; model verification and benchmarking
Analysis platforms:	OpenSees/OpenSeesPy, SAP2000, ETABS, Abaqus, Ansys, Code_Aster, FEniCS/Dolfinx, OOFEM, CalculiX; AutoCAD
Scientific computing:	Python, MATLAB, C/C++, VB.NET, PHP, JavaScript, and shell scripting; algorithm implementation, profiling, and performance benchmarking
GIS / HPC:	QGIS, ArcGIS, PostGIS; Frontera (TACC) HPC; GIS/satellite-based structural exposure and flood-impact workflows
Software & platforms:	Client-server and database-driven applications; REST-style services; Linux (Debian), Windows, Docker, Google Cloud, Primavera P6, MS Project, LaTeX, and Moodle

RESEARCH, PUBLICATIONS & PROFESSIONAL REGISTRATION

- Author/co-author of three indexed journal articles with a structural and masonry focus; additional research papers under review on brick masonry and reinforced-concrete piers. Registered Engineer, Pakistan Engineering Council (PEC).