Andre H. Tahmassian

Assistant Professor of Civil Engineering
West Virginia University Institute of Technology
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Education

Lehigh University **2026**
Ph.D. in Structural Engineering *(Expected)*
Dissertation: *Non-Ductile Shear Failure Potential and Retrofit of Pre-1995 RC Squat Walls Using Advanced Damping Solutions*
Advisor: Professor Richard Sause

Texas A&M University – College Station, TX **2010**
M.Eng. in Structural Engineering

Islamic Azad University, Najafabad Branch (IAUN) – Isfahan, Iran **1999**
B.Sc. in Civil Engineering

Academic Profile

Research Focus

Structural engineer specializing in the performance-based assessment and retrofit of aging civil infrastructure. My work bridges the gap between high-fidelity simulation and data-driven decision-making, aiming to quantify critical vulnerabilities in legacy reinforced concrete walls and bridge piers. Complementary research advances next-generation protective systems—including 3D isolation and negative stiffness mechanisms—to ensure the functional recovery of critical transportation and building networks.

Research Interests

- **Performance-Based Assessment of Aging Infrastructure:** Nonlinear mechanics of shear-critical reinforced concrete elements; quantification of stiffness degradation and shear-flexure interaction in legacy transportation assets and building systems.
- **Next-Generation Protective Systems:** Development of three-dimensional (3D) seismic isolation and smart retrofit strategies (e.g., fiber-reinforced elastomeric isolators) for functional recovery.
- **Physics-Informed Data Interpretation:** Utilization of high-fidelity finite element modeling (OpenSees and HPC) to generate synthetic damage datasets, supporting digital twins and predictive maintenance without relying on black-box algorithms.
- **Multi-Hazard Resilience:** Assessment of structural performance under near-fault pulse motions and vertical seismic excitation, and development of retrofit guidelines for pre-code infrastructure to ensure post-event operability.

Teaching Interests

- Structural analysis (classical and matrix methods), indeterminate structures, and introductory finite element applications in structural engineering.
- Reinforced concrete and steel design with emphasis on seismic detailing, code interpretation (ACI 318, AISC), and practical design examples.
- Performance-based earthquake engineering and nonlinear modeling for advanced undergraduate courses.
- Python-based computational methods and open-source tools for structural analysis and engineering education.

Teaching Experience

West Virginia University Institute of Technology (WVU Tech) **2025–Present**
Assistant Professor of Civil Engineering

- **CE 361: Structural Analysis I** (Fall 2025, Spring 2026)
- **CE 463: Steel Design** (Fall 2025)
- **CE 462: Reinforced Concrete Design** (Spring 2026)

Rowan University **Spring 2025**
Adjunct Professor

- *CEE 08573: Advanced Structural Analysis (Graduate)*
  Instructor of record for a graduate course on the Direct Stiffness Method, coordinate transformations, energy methods, nonlinear behavior, and introduction to plasticity, with computational problem sets linking performance-based analysis and structural design.

Lehigh University **2009–2024**
Graduate Teaching Assistant

- Co-developed a new course (CEE 195) integrating Python programming and AutoCAD; delivered AutoCAD lectures and final project modules.
- Supported more than ten undergraduate and graduate courses in structural analysis, mechanics, and design.

Selected Publications and Work in Progress

Journal Articles – In Preparation

Tahmassian, A. and Sause, R. *Shear Failure Risk in Pre-1995 Squat Walls with Hidden Flexural Over-Strength.* In preparation.

Tahmassian, A. and Sause, R. *Retrofitting of Squat Walls with Flexural Over-Strength Using Novel Dissipation Methods.* In preparation.

Tahmassian, A. *Machine Learning Prediction of Shear Strength in Non-Ductile Squat RC Walls.* In

preparation.

Tahmassian, A. *Effects of Vertical Ground Motions on Low Shape Factor Isolators.* In preparation.

Conference Papers

Melkumyan, M. G., and **Tahmassian (Tahmasebian), A.** (2011). Comparative analysis of buildings with fixed bases and two- and three-dimensional seismic isolation systems. 12th World Conference on Seismic Isolation, Energy Dissipation, and Active Vibration Control of Structures.

Melkumyan, M. G., **Tahmassian (Tahmasebian), A.**, & Gevorgyan, E. (2006). First research in Armenia on three-dimensional seismic isolation systems. 13th European Conference on Earthquake Engineering and Seismology (13th ECEE), Geneva, Switzerland.

Melkumyan, M., Hovhannisyan, H., Hakobyan, A., **Tahmassian (Tahmasebian), A.**, & Gevorgyan, E. (2006). Application of base isolation in the construction of multistory multifunctional buildings in Armenia. International Workshop on Base Isolated High-Rise Buildings, Yerevan, Armenia.

Research Experience

Lehigh University **2014–2026**
Advisor: Professor Richard Sause
Assessment and retrofit of pre-1995 RC squat walls

- Investigated hidden flexural overstrength and premature shear failure in squat walls; proposed indicators for non-ductile behavior.
- Developed and validated nonlinear OpenSees models with shear–flexure interaction and axial-load effects using experimental data.
- Performed large-scale nonlinear time–history analyses on HPC clusters to quantify drift, damage, and capacity degradation across detailing eras.
- Explored energy-dissipation retrofits to reduce peak shear demand and delay onset of shear distress.

American University of Armenia **2005–2007**
Advisors: Armen Der Kiureghian and Mikayel Melkumyan
Three-dimensional base isolation systems for near-fault earthquakes

- Analyzed innovative 3D isolation devices (vertical + horizontal decoupling) under near-fault vertical excitations.
- Contributed to peer-reviewed publications on the role of 3D isolation in enhancing seismic resilience.

Isfahan University of Technology **2003–2005**
Advisor: Prof. Davood Mostofinejad
Durability of concrete in marine environments under wetting–drying cycles

- Conducted accelerated wet–dry thermal/saline cycling experiments to study microcracking and strength degradation.
- Developed durability guidance for RC elements in Persian Gulf marine exposure conditions.

Professional Experience

ARORA and Associates P.C., Bethlehem, PA **2019–2022**
Structural Designer

- Participated in finite element analyses for retrofit of piers and foundations, including the Pulaski Skyway Bridge (NJ).
- Designed structural components for building and bridge projects and served as PennDOT reviewer for sign and signal structures.

Ring Consulting Group, Lansdale, PA **2013–2018**
Structural Designer

- Designed industrial, residential, and commercial structures with emphasis on seismic and wind performance in the Eastern U.S.

TMAD Taylor and Gaines (now IMEG), Pasadena, CA **2007–2008; 2011–2012**
Structural Designer

- Performed nonlinear and soil–structure interaction analyses of retrofitted buildings.
- Contributed to seismic evaluation and retrofit of Southern California hospitals, improving the performance of concrete and masonry systems to meet modern standards.

American University of Armenia, Yerevan, Armenia **2005–2007**
Research Engineer

- Performed nonlinear 2D/3D time–history analyses of base-isolated buildings and supported design/implementation of base isolation projects in Yerevan.

Sazeh Yaran Consulting Engineers, Isfahan, Iran **2002–2005**
Structural Engineer

- Designed mid-rise RC residential buildings using moment frames and shear walls in high seismic regions.

Pajoohesh & Memary Consulting Engineers, Isfahan, Iran **1999–2002**
Structural Engineer

- Designed steel frame hospital structures in seismic-prone regions (e.g., Bam, Kish Island); one hospital in Bam survived the 2003 earthquake with no structural damage.

Honors & Awards

Large Travel Grant – European Conference on Earthquake Engineering and Seismology **2006**

DAAD Summer School Program – University of Weimar, Germany **2006**

DAAD Summer School Program – University of Wuppertal, Germany **2003**

Skills

Programming and Computational Skills

Python (scientific computing, OpenSeesPy integration); experience with Unix/Linux HPC clusters and nonlinear numerical modeling.

Structural and Analysis Software

OpenSees (Tcl/Tk, Python), SAP2000, ETABS, SAFE, CSiBridge, STAAD, RAM Structural System, Perform3D.

Design, Simulation, and Documentation

AutoCAD, Tekla Tedds, Enercalc, MATLAB, MathCAD, ABAQUS, LaTeX, MS Office.

Languages

Armenian (native); English and Farsi (professional proficiency); Arabic (basic); German (limited).

Licensure & Exams

Fundamentals of Engineering Exam (EIT) — California, NCEES ID 13-247-44 *(October 2011)*

Professional Engineer (PE) — Structural, Exam Candidate *(Expected 2026)*

Professional Service & Memberships

Reviewer, *Bulletin of Earthquake Engineering* (Springer) 2010–2014
- Reviewed international submissions in earthquake engineering, structural dynamics, and seismic performance.

Technical Advisor, ASOF Seismic Safety Task-Force (Armenia), Yerevan 2023
- Provided expertise on seismic hazard assessment and earthquake safety measures to support national resilience initiatives.

Board Member, Economy and Housing of Armenian Community, Isfahan, Iran 2000–2005
- Served on a long-standing community board focused on affordable housing and poverty alleviation.

- **American Society of Civil Engineers (ASCE)** *(2013–Present)*
- **Earthquake Engineering Research Institute (EERI)** *(2014–Present)*
- **Anti-Seismic Systems International Society, Inc. (ASSISi)** *(2024–Present)*