Andre H. Tahmassian

Curriculum Vitae

Office: 117 ATLSS Drive,
Room B153,
Bethlehem, PA 18015

Email: ant208@lehigh.edu
Cell: (818) 433-8300
LinkedIn: www.linkedin.com/in/andretahmassian
Citizenship: The United States of America

EDUCATION

Lehigh University, Fall 2025
P.C. Rossin College of Engineering and Applied Science (Expected)
Ph.D. in Structural Engineering,
Dissertation: *Evaluating and Retrofitting Non-Ductile Shear Failure Potential in Pre-1995 Squat Walls using Advanced Damping Solutions*
Advisor / Mentors: Professor Richard Sause

Texas A&M University, December 2010
Zachary Department of Civil and Environmental Engineering
M.Eng. in Structural Engineering,
Advisor / Mentors: Professors Jose Roesset (Emeritus) and John Mander

American University of Armenia, March 2007
Akian College of Engineering
Research Engineer,
Advisor / Mentors: Professors Mikayel Melkumyan and Armen Der Kiureghian

Islamic Azad University, Najafabad Branch (IAUN) August 1998
Bachelor of Science in Civil Engineering,
Advisor / Mentors: Professors Kamal Mirtalaei (Emeritus) and Kiachehr Behfarnia

PUBLICATIONS

Journal Articles

Tahmassian, A. and Sause, R. (2024). Observed Potential Shear Failure in Squat Walls Due to Flexural Over-Strength Hidden in pre-1995 Structural Walls. *Journal of Structural Engineering*. Under Preparation

Tahmassian, A. and Sause, R. (2024). Retrofitting of Squat Walls with Flexural Over-Strength with Novice Dissipation Methods in pre-1995 Designed Structural Walls. *Journal of Structural Engineering.* Under Preparation

Conference Papers

Tahmassian, A. (2025). Effects of Vertical Ground Motions on Rubber Bearings: A Study on Low Shape Factor Isolators. Abstract submitted to the 19th World Conference on Seismic Isolation, Energy Dissipation and Active Vibration Control of Structures (19WCSI), Berkeley, California, USA, September 15-19.

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Melkumyan, M. G., and **Tahmassian (**Tahmasebian**), A**. (2011). *Comparative analysis of buildings with fixed base and with two- and three-dimensional seismic isolation systems*. In Proceedings of the 12th World Conference on Seismic Isolation, Energy Dissipation, and Active Vibration Control of Structures, (Paper 89)

Melkumyan, M. G., **Tahmassian (**Tahmasebian**) A.**, & Gevorgyan, E. (2006). *First research in Armenia on three-dimensional seismic isolation systems.* In Proceedings of the First European Conference on Earthquake Engineering and Seismology (13th ECEE & 30th General Assembly of the ESC), September 3-8, Geneva, Switzerland. (pp. 943-950).

Melkumyan, M., Hovhannisyan, H., Hakobyan, A., **Tahmassian (**Tahmasebian**), A.**, & Gevorgyan, E. (2006). *Application of base isolation in construction of multistory multifunctional buildings in Armenia*. In Proceedings of the International Workshop on Base Isolated High-Rise Buildings (pp. 158-172). Yerevan, Armenia: Gasprint LTD

RESEARCH EXPERIENCE

Research Interests

Seismic retrofitting of vulnerable structures, performance-based seismic analysis, and hazard mitigation through cost-effective isolation and damping systems. Structural dynamics, nonlinear analysis, and applications of machine learning in structural engineering. Engineering education for seismic resilience in developing regions.

Research Projects

Potential shear failure in squat walls caused by flexural over-strength in pre-1995 structural walls and novel retrofitting solutions using dissipation methods.

Lehigh University — January 2013
Mentor: Professor Richard Sause — December 2024
Conducted research revealing hidden flexural over-strength and risks of premature shear failure in pre-1995 structural walls. Leveraged high-fidelity nonlinear analyses and high-performance computing to enhance seismic resilience, developing novel strategies to mitigate non-ductile shear failure in squat walls.

Application of probabilistic methods to determine the capacity of FRP-wrapped reinforced concrete columns.

Texas &M University — June 2008
Mentors: Professors Roesset, Gardoni, and Mander — June 2010
Determination of the strength and capacity of FRP-wrapped reinforced concrete columns using probabilistic methods in seismic-prone regions.

Applications of three-dimensional base isolation systems in structural engineering.

American University of Armenia — May 2005
Mentor: Professor Mikayel Melkumyan — March 2007
Authored three conference papers on three-dimensional seismic isolation technology, analyzing its effectiveness in mitigating vertical impacts and protecting structures from near-field earthquakes.

Effects of wetting and drying cycles on the durability of concrete in marine environment structures.

Isfahan University of Technology, Isfahan, Iran — May 2003
Mentor: Professor Davood Mostofinejad — April 2005
Performed advanced wetting and drying simulations to assess microcrack effects on concrete durability in the Persian Gulf marine environment. The study simulated thermal and saline stresses using six-hour cycles and

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analyzed concrete samples with varied water-to-cement ratios and pozzolanic additives, both cracked and non-cracked, to replicate early-edge cracking.

Workshops / Training

Advanced Simulation for Natural Hazards Mitigation Workshop December 2016

Lehigh University, Bethlehem, PA
Gained expertise in NHERI Lehigh Experimental Facility protocols and large-scale seismic simulations with hybrid systems. Reviewed projects on steel structure seismic response and engaged in discussions on emerging natural hazards research. Acquired guidelines for proposal preparation and payload project protocols.

NHERI SimCenter Programming Bootcamp July 2020
Online
Key Takeaways: Enhanced programming skills for natural hazards research. Covered Python basics, data types, file I/O, object-oriented programming, advanced C/C++ programming, object-oriented techniques, and parallel programming with MPI.

TEACHING EXPERIENCE

Rowan University - Adjunct Faculty Spring 2025

CEE 08573: Advanced Structural Analysis – Graduate Course
Department of Civil and Environmental Engineering
Total Number of Students: 12
Covers advanced structural analysis, including the Direct Stiffness Method, coordinate transformations, virtual work principles, and nonlinear structural behavior. Topics include stability, geometric and material nonlinearities, and plasticity theory, with applications to reinforced concrete and ductile frames.

Graduate Teaching Assistant August 2023

CEE 195: Computer Methods in Civil and Environmental Engineering December 2023
Department of Civil and Environmental Engineering, Lehigh University
Mentor: Professor Maryam Rahnemoonfar
Total Number of Students: 40
Co-developed an innovative course at Lehigh University, integrating Python programming and AutoCAD for civil and environmental engineering students. Independently led the AutoCAD module, designing lectures, assignments, lab exercises, and the final project. Delivered eight lectures on computer graphic design and structural drawings, managing labs and aligning content with course objectives.

Graduate Teaching Assistant January 2023

CEE 202: Planning and Engineering Economics June 2023
CEE 207: Transportation Engineering
Department of Civil and Environmental Engineering, Lehigh University
Mentor: Professor Mesut Pervizpour
Total Number of Students: 60 (two courses combined)
Graded assignments and held office hours to mentor and assist undergraduate students in both courses.

Graduate Teaching Assistant August 2013

CEE 010: Engineering/Architectural Graphics and Design December 2013
Department of Civil and Environmental Engineering, Lehigh University August 2022
Mentor: Professor Peter Mueller December 2022

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Total Number of Students: 40 students per course (80 combined)
Managed three lab sessions per week, created assignments, and designed final exam materials. Presented two lectures on advanced topics in structural engineering, explained in simple language for undergraduate students, and aligned with their midterm exams.

Graduate Teaching Assistant
August 2009

CVEN 221: Engineering Mechanics, Statics December 2009
Zachry Department of Civil and Environmental Engineering, Texas A&M University
Mentor: Professor Mary Beth Hueste
Held office hours for three regular two-hour sessions per week. Graded all assignments, monitored and proctored exams, and assisted the course professor on a regular basis.

Current Teaching Activity
Developed four courses on the application of Python programming language in structural engineering.

- The Direct Stiffness Method for Truss Analysis with Python.
- The Direct Stiffness Method for Beams and Frames Analysis with Python.
- Finite Element Analysis of Three-Dimensional Structures with Python.
- Finite Element Analysis of Continuum Structures with Python.

These courses are prepared to teach online for graduate students in National University of Architecture and Construction of Armenia in near future.

INDUSTRY EXPERIENCE

ARORA and Associates P.C., Bethlehem, PA, January 2019
Structural Designer June 2022
Performed finite element analysis on complex structural systems, notably the retrofitting of piers and foundation system of Pulaski Skyway bridge in NJ. Participated in the analysis and design of structural elements for various types of buildings and bridges. Served as a reviewer for the Pennsylvania Department of Transportation, overseeing construction bid and design documents from manufacturers for the state's sign and signal structures.

Ring Consulting Group, Lansdale, PA, January 2013
Structural Designer December 2018
Prepared engineering calculations for a variety of structures, including industrial, residential, and commercial buildings, predominantly for projects located in the Eastern United States.

TMAD Taylor and Gaines (IMEG now), Pasadena, CA November 2011
Structural Designer December 2012
Played a key role in the seismic evaluation and retrofitting of hospital buildings in Southern California, focusing on structures from the 1960s and 1970s. Developed structural calculations to enhance seismic performance, retrofitting concrete and masonry buildings to meet modern resiliency standards.

JK Residentials, Greater Los Angeles, CA, December 2010
Independent Consultant November 2011
Consulting engineer, specializing in surveying services for a property management group.

TMAD Taylor and Gaines (IMEG now), Pasadena, CA October 2007
Structural Designer August 2008

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Performed extensive and detailed analyses of retrofitted structures using diverse modeling methods, including soil-structure interaction models, and static nonlinear analysis.

American University of Armenia, Yerevan, Armenia, June 2005
Research Engineer March 2007
Researched the response of base-isolated buildings to vertical ground motion in near-field earthquakes, utilizing 3D seismic isolation devices (3DSID) to decouple structures in vertical and horizontal directions. Conducted dynamic time history analyses on 2D and 3D models and contributed to the analysis and design of base-isolated buildings in Yerevan, Armenia.

Sazeh Yaran Consulting Engineers, Isfahan, Iran, December 2002
Structural Engineer May 2005
Analyzed and designed over 10 mid-rise reinforced concrete residential buildings. Main lateral and gravity load resisting system of the buildings were reinforced concrete moment resisting frames and shear wall structures.

Pajoohesh and Memary Consulting Engineers, Isfahan, Iran, September 1998
Structural Engineer November 2002
Analyzed and designed numerous mid-rise steel frame structures for hospitals in seismic-prone areas of Iran, including Bam and Kish Island. Notably, the hospital in Bam survived the 2003 Bam earthquake, sustaining no structural damage.

HONORS and AWARDS

Large Travel Grant September 2006
European Conference of Earthquake Engineering and Seismology

Summer School Program at the University of Weimar, Germany August 2006
International Course on Advanced Studies in Structural Engineering and Computer-Aided-Engineering, Weimar, Germany. Sponsored by German Academic Exchange Service, DAAD

Summer School Program at the University of Wuppertal, Germany September 2003
International Course in Bauinformatik (Building Information) at Bergische Universität Wuppertal, Wuppertal, Germany. Sponsored by German Academic Exchange Service, DAAD

SKILLS

Programming and Computational Skills
Proficient in Python, experience in High-Performance Computing, and Unix/Linux based operating system. Familiar with C/C++ programming languages.

Software
Proficient in *OpenSees, (both base platforms Tcl/Tk and Python), LaTeX, AutoCAD, SAP2000, ETABS, SAFE, CSi Bridge, MATLAB, MathCAD, MS Office, Enercalcs, and Tekla Tedds*.
Familiar with *STAAD, RAM Structural Systems, Perform3D, ABAQUS, and ANSYS*

Languages
Armenian (Native), English (Full Proficiency), Farsi (Full Proficiency), Arabic (Basic), German (Basic)

Certificates
Certificate of Completion - Mentoring Up Program, Lehigh University, Center for the Spring 2024

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Improvement of Mentored Experiences in Research (CIMER)

Machine Learning Specialization, Coursera (Stanford University - Affiliated), Completed courses in supervised and unsupervised learning, including practical applications in regression, classification, neural networks, and reinforcement learning. April 2024

Data Processing and Feature Engineering with MATLAB, MathWorks (Coursera), Completed course on data processing techniques and feature engineering using MATLAB. July 2020

Exploratory Data Analysis with MATLAB, MathWorks (Coursera), Completed course on exploratory data analysis techniques using MATLAB December 2020

Board Exam

Fundamental of Engineering Exam (Engineer in Training, EIT) in California, NCEES ID 13-247-44. October 2011

Professional Engineering (Structural) Exam: Qualified and will register to take the exam on Fall 2025. Fall 2025 (Expecting)

SCIENTIFIC / COMMUNITY SERVICES

Technical / Scientifical

Reviewer of Bulletin of Earthquake Engineering 2010-2014

ASOF Seismic Safety Task-Force (Armenia), Yerevan, Armenia 2023

Actively participated in seismic safety meetings focused on assessing seismic hazards and enhancing safety measures in Armenia. Contributed expertise in structural and earthquake engineering to support the mission of improving seismic resilience, despite not being an ASOF[1] member.

Community

Member of Economy and Housing of Armenian, Isfahan, Iran 2000-2005

Board member of the Armenian Committee for Economy and Housing in Isfahan, Iran. Served in a deeply rooted historical role, dated back to the 1600's during Armenians forced migration to Iran. The committee focuses on fighting poverty and providing affordable housing for needy families.

Membership

American Society of Civil Engineering 2013-Present
Earthquake Engineering Research Institute 2014-Present
ASSISi, Anti-Seismic Systems International Society, Inc., 2024-Present

[1] ASOF: Armenian Society of Fellows is an international network of scholars and experts aimed at raising Armenia's educational and research institutions to world-class levels and network them globally.