Maha Kenawy, Ph.D.

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EDUCATION

University of California, Davis, Civil and Environmental Engineering, Ph.D., 2018
Area of Specialization: Structural Engineering, minor in Computational Mechanics

American University in Cairo, Egypt, Construction Engineering, M.Sc., 2015
Area of Specialization: Structural Engineering and Construction Materials

American University in Cairo, Egypt, Construction Engineering, B.Sc. *Magna Cum Laude* (High Honors), 2011
Area of Specialization: Structures and Construction Materials

American University in Cairo, Egypt, minor in Journalism and Mass Communication

FELLOWSHIPS AND AWARDS

2019 Professional Development Postdoctoral Travel Award, University of Nevada, Reno
2019 Natural Hazards Engineering Research Infrastructure (NHERI) SimCenter Programming Bootcamp Travel Award, National Science Foundation (NSF)
2019 NHERI Summer Institute Travel Grant, NSF *(award amount: $2,500)*
2019 Annual Meeting Registration Grant for Early Career Professionals, Earthquake Engineering Research Institute
2017 Graduate Studies Travel Award, UC Davis
2017 Finalist for the Outstanding Graduate Student Teaching Award, UC Davis
2016 *O.H. Ammann Research Award* in Structural Engineering, American Society of Civil Engineers, Structural Engineering Institute *(award amount: $8,000)*
2014 Civil and Environmental Engineering Graduate Fellowship, UC Davis
2013 Honors Graduate Student Award in Construction Engineering, American University in Cairo (AUC)
2011 Laboratory Instruction Graduate Fellowship, Construction Engineering, AUC - *Full tuitions for the Master's program study*
2010 Honors Undergraduate Student Award in Construction Engineering, AUC
2005 Leadership for Education and Development (LEAD) undergraduate scholarship, AUC - *Full tuitions and monthly stipend for a 5-year undergraduate course of study*

PROFESSIONAL APPOINTMENTS

Postdoctoral Scholar, Civil and Environmental Engineering, University of Nevada, Reno (2019 – present)
Supervisor: David McCallen
Project: High Performance, Multidisciplinary Simulations for Regional Scale Earthquake Hazard and Risk (Funded by the Department of Energy)
Creates new numerical models, and conducts computational research to characterize the risks to reinforced concrete buildings due to earthquake hazard in the near-fault region.

RESEARCH EXPERIENCE

Graduate Student Researcher, Civil and Environmental Engineering (CEE), University of California, Davis (2015 – 2018)

Advisors: Sashi Kunnath and Amit Kanvinde
Project: Nonlocal formulations for robust macro-scale simulations of instability and localization in reinforced concrete and structural steel frame elements (funded by NSF – Grant# CMMI 1434300)
Pioneered the development of a multiscale computational framework for predicting deterioration and collapse of reinforced concrete structures subjected to extreme events.

Graduate Student Researcher, CEE, University of California, Davis (2017 –2018)
Advisor: Sashi Kunnath
Project: Developing Reliable Seismic Demand Models with Limited Data
Introduced a regularized statistical approach to reduce the uncertainty associated with predicting structural response using small sets of earthquake ground motion data.

Graduate Student Researcher, CEE, University of California, Davis (2018)
Advisor: Sashi Kunnath
Project: Robust Numerical Models for Predicting the Shear-Controlled Response of Reinforced Concrete Squat Walls
Investigated several approaches for modeling the behavior of squat walls.

Graduate Student Researcher, Construction Engineering, American University in Cairo (2012 – 2014)
Advisors: Mohamed Naiem Abdel-Mooty and Khaled Nassar
Project: Segmented Precast Concrete Spherical Shell Structures: Geometry, Structural Stability and Construction
Invented a modular precast concrete shell structure to improve the construction, durability and performance of reinforced concrete large-span roof systems, and assessed its performance using numerical finite element studies and experimental tests.

PUBLICATIONS

Journal Articles

2019 **Kenawy, M**., Kunnath, S.K., Kolwankar, S., and Kanvinde, A. "Concrete Nonlocal Uniaxial Damage-Plasticity Model for Simulating the Post-Peak Response of Reinforced Concrete Beam-Columns under Cyclic Loading," *Journal of Structural Engineering* (*in press*).

2019 Kolwankar, S., Kanvinde, A., **Kenawy, M.**, Lignos, D., & Kunnath, S. "Simulating Cyclic Local Buckling Induced Softening in Steel Beam-Columns Using A Nonlocal Material Model in Displacement-Based Fiber Elements," *Journal of Structural Engineering*, 146(1), 04019174.

2018 **Kenawy, M**., Kunnath, S.K., Kolwankar, S., and Kanvinde, A. "Fiber-Based Nonlocal Formulation for Simulating Softening in Reinforced Concrete Beam-Columns," *Journal of Structural Engineering*, 144(12), 04018217.

2018 Kolwankar, S., Kanvinde, A., **Kenawy, M.**, Lignos, D., & Kunnath, S. "Simulating Local Buckling-Induced Softening in Steel Members Using an Equivalent Nonlocal Material Model in Displacement-Based Fiber Elements," *Journal of Structural Engineering*, 144(10), 04018192.

2017 Kolwankar, S., Kanvinde, A., **Kenawy, M**., and Kunnath, S.K. "Uniaxial Nonlocal Formulation for Geometric Nonlinearity-Induced Necking and Buckling Localization in a Steel Bar," *Journal of Structural Engineering*, 143(9), 04017091.

Journal Articles (in preparation)

2019 **Kenawy, M**., McCallen, D. "Near-Fault Earthquake Risk to Reinforced Concrete Buildings Based on High-Resolution Physics-Based Ground Motion Simulations *Expected submission date: November 2019.*

2019 **Kenawy, M**. "Enhanced Hysteretic Concrete Model for Mesh-Objective Nonlinear Dynamic Analysis of Reinforced Concrete Frames." *Expected submission date: December 2019.*

Conference Proceedings, Presentations and Posters

2019 **Kenawy, M**., Kunnath, S.K., and Kanvinde A. "Advancing the Seismic Collapse Assessment of Reinforced Concrete Structures Using Nonlocal Frame Models." *2019 Engineering Mechanics Institute Conference*, June 18-21, Pasadena, CA.

2019 **Kenawy, M.,** Kunnath S.K. and Kanvinde A. "Nonlocal Computational Framework for Simulating Collapse in Reinforced Concrete Structures under Earthquake Loading." Poster presented at the *2019 Pacific Earthquake Engineering Research Center (PEER) Annual Meeting*, January 17-18, Los Angeles, CA.

2018 **Kenawy, M.,** Ahmadi, A. and Kunnath, S.K. "Developing Reliable Seismic Demand Models with Limited Data." *11th U.S. National Conference on Earthquake Engineering*, June 24-29, Los Angeles, CA.

2018 **Kenawy, M**., Kunnath, S.K., and Kanvinde A. "Nonlocal fiber-based frame model for simulating the post-peak response of reinforced concrete beam-columns." *2018 Engineering Mechanics Institute Conference*, May 29-June 2, Cambridge, MA.

2018 **Kenawy, M**., Kunnath, S.K., and Kanvinde A. "Fiber-Based Nonlocal Formulation for Simulating Softening in Reinforced Concrete Beam-Columns." Poster presented at the *2018 PEER Annual Meeting*, January 18-19, Berkeley, CA.

2017 **Kenawy, M**., Kunnath, S.K., and Kanvinde A. "Nonlocal formulation for a displacement-based fiber beam-column element." *ASCE Structures Congress 2017*, April 5-8, Denver, CO.

Dissertation, Theses and Reports

2018 **Kenawy, M**. (2018). "Nonlocal Computational Framework for Simulating Extreme Limit States in Reinforced Concrete Structures," Ph.D. Dissertation, University of California, Davis.

2018 Amanda Slawinski, David Yoo, **Maha Kenawy**, Yolanda Alberto, Omar Plata, Mehmet Unal, Ana Orozco, Yolanda Alberto, Setare Hajarolasvadi, Wael Hassan, Erica Fischer, and Manny Hakhamaneshi (October 2018). "Virtual Earthquake Reconnaissance Team (VERT): Immediate Response to M7.5 & Tsunami, Palu-Indonesia," *EERI Learning from Earthquakes program*.

2014 **Kenawy, M**. (2014). "A Proposed Segmented Precast Concrete Spherical Cap: Geometry, Structural Stability and Construction," M.Sc. Thesis, American University in Cairo, Egypt.

INVITED TALKS

2019 **Kenawy, M.,** From Localized Damage to Regional Collapse Assessment: Characterizing the Performance of Reinforced Concrete Structures Subjected to

Earthquakes. Civil and Environmental Engineering Research Seminar Guest Lecture, *University of Nevada, Reno.*

2019 **Kenawy, M.,** From Localized Damage to Global Structural Collapse: Advancing Multiscale Modeling of Civil Structures for Earthquake Engineering. Department of Civil and Environmental Engineering, *Georgia Institute of Technology.*

2019 **Kenawy, M.,** Advancing Multiscale Hazard-Based Computational Modeling of Civil Structures. Department of Civil and Environmental Engineering, *University of Nevada, Reno.*

2019 **Kenawy, M.,** Advancing Computational Modeling of Reinforced Concrete Structures for Earthquake Engineering. EERI Younger Members Committee Seminar Series, Department of Civil Engineering, *Ain Shams University, Cairo, Egypt.*

2018 **Kenawy, M.**, Enhanced Fiber-Based Frame Model for Simulating Cyclic Degradation of Reinforced Concrete Beam-columns. Civil and Environmental Engineering Department Seminar, *University of California, Berkeley.*

TEACHING AND MENTORSHIP

Instructor-of-Record, CEE, University of California, Davis
Engineering Statics *(Summer 2016)*

Research Mentor, CEE, University of California, Davis
Undergraduate Research *(Spring 2018)*
Student: Torynne Hart-Dillon

Teaching Assistant, CEE, University of California, Davis
Undergraduate Senior Design (*Winter 2018, Spring 18*)
Mechanics of Materials (*Spring* 2017)
Earthquake Loads on Structures *(Winter 2017)*
Matrix Structural Analysis *(Spring 2016)*
Mechanics of Materials Lab *(Winter 2016)*
Engineering Statics *(Winter 2015, Spring 2016, Fall 2016, Fall 2017)*

Teaching Assistant, Construction Engineering, American University in Cairo
Engineering Statics *(Fall 2012, Fall 2013)*
Structural Analysis *(Spring 2012)*
Structural Design *(Spring 2012, Fall 2012, Spring 2013)*
Structural Systems and Advanced Design *(Fall 2011, Spring 2012, Fall 2012, Spring 2013)*
Tall Buildings and Large Span Structures *(Winter 2012)*

ACADEMIC AND PROFESSSIONAL SERVICE

Co-Chair, Younger Members Committee (YMC), Earthquake Engineering Research Institute (EERI) (2019 – 2021)
Leads several initiatives for fostering the professional development of students and young professionals and academics in the earthquake engineering community.

Peer reviewer, ASCE Journal of Structural Engineering *(2018 – present)*

Secretary, Student Leadership Council, EERI *(2017 –2018)*

Member of the executive committee which organized and hosted the 2018 undergraduate Seismic Design Competition, and the Post-Earthquake Reconnaissance Workshop during the *11th National Conference on Earthquake Engineering*.

Member, EERI Virtual Earthquake Reconnaissance Team, Learning from Earthquakes program *(2018 – present)*

President, EERI UC Davis Chapter *(2017 – 2018)*
Recipient of the 2018 Friedman Family Visiting Professionals Program fellowship.

Doctoral Representative of the Structural Engineering and Structural Mechanics Group, Graduate Student Advisory Committee, CEE, University of California, Davis *(2018)*

Outreach Committee Chair, Student Leadership Council, EERI *(2016 – 2017)*
Evaluated technical proposals, participated in the technical judging, and recruited industry professionals as judges for the 2017 undergraduate Seismic Design Competition.

Member, Society of Women Engineers (SWE) – UC Davis Section *(2017 – 2018)*
Participated in organizing and hosting educational outreach events for middle school students, and mentorship programs for undergraduate students.

PROFESSIONAL INTERNSHIPS

Structural Engineering Intern, Egyptian Group for Engineering Consultants *(2010)*
Conducted structural analysis and design for residential building projects.

Construction Engineering Intern, Orascom Construction Industries *(2009)*
Supervised on-site construction, revised structural drawings, and implemented a quality-check system for structural components at a large-scale real estate project.

Construction Management Intern, Projacs International *(2008)*
Developed feasibility studies for new real estate projects in Cairo, Egypt.

PROFESSIONAL MEMBERSHIPS

Young professional member of the Earthquake Engineering Research Institute
Associate member of the American Society of Civil Engineers
Affiliate member of the National Postdoctoral Association

MODELING/PROGRAMMING SKILLS

Programming Languages: *compiled:* C++, C; *interpreted:* MATLAB
Structural analysis platforms: OpenSees, ABAQUS, ANSYS, SAP2000, ETABS
Geometric design software: SolidWorks, AutoCAD

COMMUNITY INVOLVEMENT

Technical Judge, UC Davis Mathematics, Engineering, Science and Achievement Day Competition *(2018)*
Volunteer, shake table demonstrations for Davis community, UC Davis Picnic Day *(2018)*
Editor, Arts and Entertainment section, AUC newspaper *The Independent (2011 - 2012)*
Mathematics Teacher, *AYB* Sustainable Development Organization *(2011)*
Designed and taught a mathematics curriculum in an underdeveloped Cairo community.
Director, University Book Fair, AUC Student Union (2009)
Director, Student Academic Development Program, AUC Student Union *(2007)*