Jessica A. Rosewitz, P.E., Ph.D.

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EDUCATION

- **Ph.D. in Civil Engineering, 2020**
  Worcester Polytechnic Institute, Department of Civil & Environmental Engineering
- **Certificate in College Teaching, 2017**
  Higher Education Consortium of Central Massachusetts (HECCMA)
- **M.Sc. in Civil Engineering, 2016**
  Worcester Polytechnic Institute, Department of Civil & Environmental Engineering
- **B.Sc. in Civil Engineering, 2007**
  Worcester Polytechnic Institute, Department of Civil & Environmental Engineering

APPOINTMENTS AND TEACHING EXPERIENCE

- **Worcester Polytechnic Institute – Assistant Teaching Professor, Department of Civil & Environmental Engineering, 2021 – Present**
  - Project Management
  - Advanced Project Management
- **Assumption University – Adjunct Professor, Department of Biological & Physical Sciences, Undergraduate courses, 2021**
  - Introduction to Engineering Problem Solving, Spring 2021
- **Worcester Polytechnic Institute – Adjunct Professor, Department of Civil & Environmental Engineering, Undergraduate courses, 2019 – 2021**
  - Prestressed Concrete Design, co-taught w/ Dr. Kemal Arsava, Fall 2019
  - Design of Reinforced Concrete Structures, Fall 2019
  - Introduction to Analysis and Design, Spring 2019
  - Structural Engineering, Spring 2020
  - Project Management, Fall 2020
  - Fundamentals of Civil Engineering AutoCAD, Spring 2021

RESEARCH INTERESTS

- **Innovating project management and engineering education in the modern world.** As the rapid growth of the construction industry and job prospects in CPM increases, the discipline is at an inflection point of high demand and need for sustainable innovation. Opportunities exist to leverage connections and create lasting collaborations with diverse faculty and students: in Robotics to advance communication, increase worker safety through monitoring and task automation, reduce construction timelines and delays, and employ a drone workforce; in Industrial Engineering to accelerate construction through prefabrication and automation, and leverage parametric modeling such as BIM for improved manufacturing; and in collaborating with Materials and Environmental Scientists to design "green" building materials for a sustainable built world to drive innovation for modern construction materials.

- **Modern design of concrete and repair methods.** The modernization of concrete is necessary to meet the challenges of today's society: increase resiliency and sustainability, use recycled materials, and reduce carbon footprint. Repair methods should also follow these guidelines. The use of recycled plastics as reinforcement and biological materials such as enzymes to accelerate the repair concrete can improve rehabilitation methods and improve sustainability.
- **Restoration of historic art and structures.** Historic and priceless artworks, specifically statues or structures, can be weakened by exposure to weather, prior repairs, moving of the artwork, and settlement of the supporting soil or substrate, in addition to other causes. The strengthening and repair, specifically with regard to stone, is an avid interest of mine. Practical methods focus on replication and strength testing of potential repairs, complemented by finite element analysis simulation.

GRANTS RECEIVED

- **NSF I-Corps Site Program Fellow**, $500, WPI, Worcester, MA, 2019

PROJECT MENTORING

- **Worcester Polytechnic Institute, Undergraduate students**
  - MQP: Emma Edwardson. Co-Advisor: Prof. Nima Rahbar, 2019 – 2020
  - MQP: Gordon Murray, Paul Rivera, and Oliver Brochu. Co-Advisor: Prof. Nima Rahbar, 2019 – 2020
  - IQP: David Shlomo Ellis-Rech, Erica Lee, Nicholas Wood, and Spencer Gregg. Co-Advisor: Dr. Kathy Chen, 2019 – 2020

EMPLOYMENT

- **Teaching Assistant**, WPI, Aug 2015 – Dec 2018
  Collaborated with the professor to plan and lead conferences and help sessions; tutored individual students; graded coursework and exams; maintained online learning platform. Courses include: Analytical Mechanics I & II, Intro to Analysis & Design, Fundamentals of Civil Engineering AutoCAD, Materials of Construction, Reinforced Concrete, Prestressed Concrete, Foundation Engineering, and Matrix Analysis of Structures.
- **Research Assistant**, WPI, Nov 2014 – May 2020
  Researcher in the Bioinspired Materials Design Lab, under Professor Nima Rahbar. Investigated the capabilities of using an enzyme to repair cracks and flaws in concrete; designed, created, and evaluated cement-polymer composites with intricate internal structures; and supported the repair of artwork with finite element modeling and analysis in partnership with the New York Metropolitan Museum of Art.
- **Structural Engineer**, CME Associates, Inc., East Hartford, CT, Jun 2007 – Dec 2013
  Provided wide range of conventional and accelerated design and construction services for bridge and highway design projects. Scope of responsibilities included design of steel, concrete, and timber superstructures to AASHTO LRFD Specifications; foundations, culverts, and other substructure elements; highway layout for bridges; and cost estimation, special provisions, construction plans, and inspection reports.

JOURNAL PUBLICATIONS

- **J.A. Rosewitz**, H. Ashouri Choshali, N. Rahbar, "Bioinspired design of architected cement-polymer composites." Cement and Concrete Composites, 96, 02/2019, p. 252-265, DOI:10.1016/j.cemenconcomp.2018.12.010.
- **J.A. Rosewitz**, N. Rahbar, "Advanced Conservation Methods for Historical Monuments," Book: Advanced Materials for the Conservation of Stone, Ch2, pp27-55, Springer, DOI:10.1007/978-3-319-72260-3.
- **J.A. Rosewitz**, C. Muir, C. Riccardelli, G. Wheeler, N. Rahbar, "A multimodal study of pinning selection for restoration of a historic statue," Mat. Des., 98, 03/2016, p. 294-304, DOI:10.1016/j.matdes.2016.03.004.

PEER REVIEWED CONFERENCE PROCEEDINGS

- **J.A. Rosewitz,** K.C. Chen, "Work-in-Progress: Investigating student growth through a multidisciplinary qualifying project of an interactive ball wall display to support Pre-K STEAM learning at a community early education and care center." ASEE's Virtual Conference, Jun 22 – 26, 2020, Paper ID #31532.

PATENTS

- N. Rahbar, S.F. Scarlata, **J.A. Rosewitz,** "Method for Enzymatic Repair of Cementitious Surfaces," U.S. Patent 10,647,617 B2, Granted: May 12, 2020

CONFERENCE PRESENTATIONS AND POSTERS

- **J.A. Rosewitz**, S.F. Scarlata, N. Rahbar, "Naturally Motivated Concrete Healing." Poster presented at: 2019 Graduate Research Innovation Exchange, WPI.
- J.A. Rosewitz, N. Rahbar, "Naturally motivated concrete healing," 2019 ASCE Engineering Mechanics Institute, Caltech, Pasadena, CA.
- **J.A. Rosewitz**, "Bioinspired design of cement-polymer composites." Poster presented at: 2018 MRS Fall Meeting & Exhibit, Boston, MA.
- J.A. Rosewitz, H. Ashouri Choshali, N. Rahbar, "Bioinspired design of cement-polymer composites," 2018 ASCE Engineering Mechanics Institute, MIT, Cambridge, MA.
- **J.A. Rosewitz**, S.F. Scarlata, N. Rahbar, "A novel method for damage-healing of concrete using bovine Carbonic anhydrase enzyme." Poster presented at: 2017 Gordon Research Conference & Seminar on Science of Adhesion, Mount Holyoke College.
- H. Ashouri Choshali, J.A. Rosewitz, N. Rahbar, "Effect of Bricks Waviness on the Mechanical Response of Nacre-inspired Composites," 2017 Annual Meeting of the Society of Engineering Science, Northeastern University, Boston, MA.
- **J.A. Rosewitz**, "Bioinspired cement polymer composites." Poster presented at: 2017 Graduate Research Innovation Exchange, WPI.

- **J.A. Rosewitz**, L. Urso, C. Flanagan, N. Rahbar, "Bioinspired design of cement polymer composites." Presentation at: The 9th International Conference (2016) on Fracture Mechanics of Concrete and Concrete Structures, University of California, Berkeley.
- **J.A. Rosewitz**, "Bioinspired cement polymer composites." Poster presented at: 2016 Graduate Research Innovation Exchange, WPI.
- **J.A. Rosewitz**, L. Urso, C. Flanagan, N. Rahbar "Bioinspired Design of Cement Polymer Composites," 2016 ASCE Engineering Mechanics Institute, Vanderbilt University, Nashville, TN.
- **J.A. Rosewitz**, "Mechanics-based material selection for restoration of a historic statue." Poster presented at: 2014 Graduate Research Innovation Exchange, WPI.

AWARDS, AND HONORS

- Frederick Sanger Graduate Award, Leadership & Academic Achievement, WPI, 2019, 2020
- Ralph E. Spaulding Fellow, WPI, Jan 2019 – May 2019
- Graduate Students Travel Fund Grant, WPI, 2015 – 2016
- ACI Kumar Mehta Scholarship, ACI Foundation, 2015 – 2016
- WPI Morgan Teaching & Learning Center, Class of 1957, Dean of Graduate Studies, Tuition Assistance for HECCMA CCT, 2014 – 2017

PROFESSIONAL SERVICE

- Judge, WPI GPS Seminar, WPI, 2021
- Judge, Mass. Academy of Math and Science, STEM Science Fair, WPI, 2016 – 2021
- Mentor, Student AISC Steel Bridge team, WPI, 2015 – 2020
- Workshop lead, Women in STEM Conference, WPI, 2019
- Workshop lead, TouchTomorrow, WPI, 2015 – 2019
- Committee member, Math & Science for Sub-Saharan Africa (MS4SSA) Conference, WPI, 2015 – 2017
- Search committee for the Associate Director for TA and PLA Development of the Morgan Teaching and Learning Center, WPI, 2017
- Volunteer, Introduce a Girl to Engineering, WPI, 2017
- Graduate Student Member, Campus Hearing Board, WPI, 2016 – 2017
- Search committee for the Vice Provost for Research, WPI, 2016
- Mentor, Commonwealth School Project Week, WPI, 2015 – 2020

PROFESSIONAL MEMBERSHIPS

- Sigma Xi, 2016 – Present
- American Society of Civil Engineers, 2011 – Present
- American Society for Engineering Education, 2017 – Present