

# MANISH ROY

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## EDUCATION

- Ph.D. in Civil Engineering**, University of Connecticut, Storrs, CT **Aug 2019**  
*Dissertation title:* "Investigation of the Bond Behavior of Steel Reinforcement Bars Embedded in Ultra High Performance Concrete under Static Loads using Finite Element Modeling"  
*Advisors:* Kay Wille (Major), Jeongho Kim, Michael Accorsi
- Graduate Certificate in College Instruction**, University of Connecticut, Storrs, CT **Dec 2020 (Expected)**  
*Program Advisor:* Robin Grenier
- M.S. in Civil Engineering**, West Virginia University, Morgantown, WV **Dec 2011**  
*Thesis title:* "Development and evaluation of high performance fiber reinforced concrete as a repairing material"  
*Advisors:* Indrajit Ray (Major), Julio Davalos, An Chen
- B.E. (Hons.) in Civil Engineering**, Jadavpur University, Kolkata, West Bengal, India **Jun 2000**

## TEACHING EXPERIENCE

- Teaching Assistant** – Physics Dept., University of Connecticut, CT **2014-2019**
- Instructor on record for Mechanics Labs (PHYS 1201Q / 1401Q / 1501Q) for undergraduate students
  - Helped students carry out experiments to prove certain laws of physics
  - Taught how to analyze experimental data with simple statistical methods and draw conclusions from the analyzed data
  - Taught how to write technical reports in order to communicate the findings in a clear and concise manner
  - Graded assignments and gave continuous feedback to students using online learning management system (HuskyCT) in order to help them keep track of their progress
  - Prepared syllabus and held office hours
  - Conducted TA meetings to train new graduate TAs for the following weeks' lab activities when the lab manager was not available
- Teaching Assistant** – Civil Engineering Dept., University of Connecticut, CT **2017**
- Developed pre- and post-lab quizzes on HuskyCT for CE Materials (CE 3520) Lab
- Teaching Assistant** – Civil Engineering Dept., University of Connecticut, CT **2012-2013**
- Teaching assistant for Design of Reinforced Concrete (CE 3640) Lab
  - Taught how to analyze different types of loads on reinforced concrete structural elements
  - Taught how to design RC structural members using StructurePoint computer program
  - Designed the practice problems in a way that reinforced the concepts learned in the lecture classes
  - Helped students in their final design projects
  - Gave lectures on three sections of design of reinforced concrete structures when the course instructor was out of town (class strength ~ 90 students)
- Teaching Assistant** – Civil Engineering Dept., West Virginia University, WV **2011**
- Teaching assistant for Timber Design (CE 464) Course
  - Taught three sections when the instructor was out of town
  - Held discussion sessions to reinforce the concepts learned in the class
  - Graded assignments and gave continuous feedback to students in order to help them keep track of their progress

- Teaching Assistant** – Civil Engineering Dept., West Virginia University, WV **2009**
- Teaching assistant for Structural Analysis-I (CE 361) [Lecture/ Lab]
  - Prepared and conducted laboratory activities where students applied the theory of structures learned in the class
  - Graded assignments and gave continuous feedback to students in order to help them keep track of their progress
  - Taught three sections on structural analysis when the instructor was out of town

**TEACHING INTERESTS**

- Concrete materials
- Design of reinforced concrete structures
- Structural analysis
- Mechanics of materials
- Civil engineering materials
- Willing to learn and prepare to teach other courses

**RESEARCH EXPERIENCE**

- Graduate Assistant** – Civil Engineering Dept., University of Connecticut, CT **2012-2019**
- Developed a novel method in modeling UHPC: fibers modeled as smeared reinforcement and matrix modeled as bulk material
  - Investigated the effect of fiber volume fraction and fiber orientation on the pullout behavior of reinforcement steel bars embedded in UHPC by finite element simulation
  - Determined the effect of fiber volume fraction and fiber orientation on the uniaxial tensile behavior of rebar-reinforced UHPC by finite element simulation
  - Investigated the interaction between ultra-high performance concrete (UHPC) and steel shear studs by finite element simulation of push-out tests

- Graduate Research Assistant** – Civil Engineering Dept., West Virginia University, WV **2009-2011**
- Developed high performance fiber reinforced concrete (HPFRC) using locally available commercial ingredients
  - Characterized the compressive / flexural load-displacement behavior of HPFRC cured under different temperature conditions
  - Evaluated the bond behavior between normal-strength concrete and HPFRC (by pull-off, slant shear, and block shear tests)

**RESEARCH INTERESTS**

- Finite element modeling of cementitious materials
- Experimental testing of high performance concrete / composite construction materials
- Repair / rehabilitation of concrete structures

**PROFESSIONAL EXPERIENCE**

- Manager** – DC Industrial Plant Services Pvt. Ltd., India **2009**
- Planned and monitored civil and structural work of Ash Handling System of a 1500 MW super thermal power plant for NTPC, a govt. agency.
- Assistant Manager** – Development Consultants Pvt. Ltd., India (Kuljian group) **2007-2009**
- Worked as a project management consultant in a large multi-storied housing complex (incl. sixteen storied and fourteen storied buildings).
- Senior Engineer** – Shapoorji Pallonji & Co. Ltd., Bangladesh **2005-2007**
- Managed the planning of the construction of \$6M New Canadian Chancery and Official Residence Project of Foreign Affairs Canada in Dhaka, Bangladesh.
- Senior Engineer / Assistant Engineer** – Shapoorji Pallonji & Co. Ltd., India **2000-2004**
- Worked in diverse areas of civil engineering, such as, construction supervision, quality control, planning and billing, business development, tendering, and estimation.

- Trained engineers on Enterprise Resource Planning (ERP) software
- Awarded the Best Employee of Eastern Region

## **PUBLICATIONS**

### *Journals:*

Jiao, P., **Roy, M.**, Barri, K., Zhu, R., Ray, I., and Alavi, A.H. (2019). " High-performance fiber reinforced concrete as a repairing material to normal concrete structures: Experiments, numerical simulations and a machine learning-based prediction model." *Construction and Building Materials* 223 (2019) 1167-1181.

**Roy, M.**; Hollmann, C.; Wille, K. (2019) "Influence of Fiber Volume Fraction and Fiber Orientation on the Uniaxial Tensile Behavior of Rebar-Reinforced Ultra-High Performance Concrete." *Fibers* (2019), 7, 67.

**Roy, M.**, Hollmann, C., and Wille, K. (2017). "Influence of volume fraction and orientation of fibers on the pullout behavior of reinforcement bar embedded in ultra high performance concrete", *Construction and Building Materials* 146 (2017) 582–593.

**Roy, M.**, Ray, I., and Davalos, J.F. (2014). "High Performance Fiber Reinforced Concrete: Development and Evaluation as a Repairing Material." *J. Mater. Civ. Eng.*, 2014, 26(10), pp. 04014074-1 - 10.

### *Conference Proceedings:*

**Roy, M.**, Hollmann, C., and Wille, K. (2016). "Effect of Fiber Orientation on Pullout Behavior of Rebar Embedded in UHPC", 4<sup>th</sup> International Symposium on Ultra-High Performance Concrete and High Performance Construction Materials, Kassel, Germany. March 9-11, 2016.

## **ORAL PRESENTATIONS**

"*Calibrating Tensile Properties of UHPC with Smearred Fibers,*" ACI Spring 2016: The Concrete Convention and Exposition, Milwaukee, WI, April, 2016.

"*Numerical Simulation of Ultra-High Performance Fiber Reinforced Concrete in Compression and Tension,*" Seventh M.I.T. Conference on Computational Fluid and Solid Mechanics, Cambridge, MA, June, 2013.

"*Development and Characterization of Multifunctional Cementitious Systems using Nanomaterials: A Plan of Study,*" 21<sup>st</sup> Annual NIST Computer Modeling Workshop, Baltimore, MD, August, 2010.

## **HONORS AND AWARDS**

### **University of Connecticut**

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|---|------------------|
| • Commendation Letter for Excellence in Teaching from the Office of the Provost | <b>2015-2018</b> |
| • "Fall 2018 Doctoral Dissertation Fellowship" by the Graduate School           | <b>2018</b>      |
| • "Spring 2016 Graduate Travel Award" by the Graduate School                    | <b>2016</b>      |
| • "Narasimha Rao Adidam Memorial Scholarship" by CEE department                 | <b>2014</b>      |
| • "Pre-doctoral Fellowship" by CEE department                                   | <b>2012-13</b>   |

### **NorthEast Transportation Training and Certification Program (NETTCP)**

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|-------------------------------|-------------|
| • "Jack Stephens Scholarship" | <b>2012</b> |
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### **Prestressed Concrete Institute**

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| • 3rd place in Zone 4 of PCI Big Beam Contest 2010 (along with two other fellow graduate students) | <b>2010</b> |
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## **TRAINING AND CERTIFICATIONS**

### **University of Connecticut**

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| • Completed an online short course on " <i>Designing Your Hybrid Blended Course</i> " offered by eCampus | <b>2019</b> |
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- Completed an online short course on “*Exploring Online Learning*” offered by eCampus 2018
- Attended a webinar titled “*Getting Started with Flipped Instruction Webinar*” offered by the Center for Excellence in Teaching and Learning (CETL) 2018
- Participated in a year-long Networked Improved Community (NIC) project “*Teaching through Diversity*” offered by the Neag School of Education 2017-18
- Attended annual “*Faculty Teaching Workshop*” organized by CETL 2017-19
- Attended “*2019 Conference for First Year Innovation*” organized by FYP 2019
- Attended a seminar on “*Basics of Learning Science and Its Strategies*” organized by CETL 2018
- Attended a seminar on “*Experiential Learning*” organized by CETL 2019
- Attended a seminar on “*Approaches and Techniques for Assessments in Undergraduate Courses*” organized by CETL 2018
- Attended a seminar titled “*Make it Stick, The Science of Successful Learning*” presented by Peter Brown 2018
- Attended a conference on “*Teaching at Teaching Intensive Institutions*” at Westfield State University, MA 2018

## **UNIVERSITY SERVICES**

### **University of Connecticut**

- Talked on the panel “*Preparing to teach*” at the New TA Orientation organized by CETL 2019
- Helped the School of Engineering in “*Explore Engineering*” – an outreach activity for middle school students 2014-2018
- Maintained the research group website of Advanced Cementitious Materials and Composites Laboratory (ACMC) 2012-2019
- Judged the invention of middle school students at the annual Connecticut Invention Convension (CIC) 2018
- Helped the School of Engineering in the daVinci Project – an outreach activity geared toward math, science, and technology teachers of grades 5-12 2017

### **West Virginia University**

- Judged the mini-bowling competition in ASCE Virginias’ Conference 2011

## **PROFESSIONAL SERVICES**

### **Reviewer**

- “2019 ASEE Annual Conference & Exposition” organized by the American Society for Engineering Education (ASEE) 2018-2019
- Journal of Materials in Civil Engineering of American Society of Civil Engineers (ASCE) 2013

### **Mentor**

- American Society of Civil Engineers (ASCE) 2019

## **TECHNICAL SKILLS**

- Finite Element Analysis packages – Abaqus, Atena, LS-Dyna
- Programming languages – MATLAB, C, Fortran
- Computer aided design – AutoCAD
- Structural analysis and design – StructurePoint, RISA 2D

## **PROFESSIONAL MEMBERSHIPS**

- American Concrete Institute (ACI)
- American Society of Civil Engineers (ASCE)
- American Society for Engineering Education (ASEE)