

# Caroline J. Williams

1 Easton Ct, Newark, DE 19711  
734-351-1350 | cjw@udel.edu

## Education

- University of Delaware – Newark, DE, USA** **Aug 2019 – Present**  
*Doctor of Philosophy (PhD) in Civil Engineering: Concentration in Civil Infrastructure Systems*  
Key Courses: Convex Optimization; GIS; Python & MATLAB Programming
- University of Cambridge, St Edmund's College – Cambridge, UK** **Oct 2015 – Aug 2016**  
*Master of Philosophy (MPhil) in Engineering for Sustainable Development* Grade: Pass (Equivalency: 3.6/4.0)  
Key Courses: Development Engineering; Policy, Legislation, and Government; Microeconomics; Sustainability Methods and Metrics; Sustainability of Large Infrastructure; Finance; Negotiation;
- Michigan State University - East Lansing, Michigan, USA** **Aug 2010 – May 2014**  
*Bachelor of Science (BS) in Civil Engineering; Minor in Material Science Engineering* GPA: 3.84/4.00  
Honors College Member
- Kathmandu University - Dhulikhel, Nepal** **Jun 2013 – Aug 2013**  
Engineering for Developing Communities study abroad course
- Anadolu University – Eskişehir, Turkey** **Jun 2012 – Aug 2012**  
Hydrology and transportation engineering study abroad course

## Research Experience

- University of Delaware** **Aug 2019 – Present**
- **Graduate Research Project:** *Multi-stakeholder Disaster Risk Management Framework for Hurricane Preparedness*  
Advisor: Dr. Rachel Davidson, Department of Civil & Environmental Engineering
    - Utilized network of professionals to recruit participants for the inter-disciplinary stakeholder workshop
    - Reviewed and annotated supporting literature
- University of Cambridge** **Jan 2016 – Aug 2016**
- **Master's Dissertation:** *Identification Methods for Aid Distribution Following Natural Disaster Events*  
Advisor: Emily So, PhD, Department of Architecture
    - **Objective:** Assessed the ability of technology-based identification systems to improve aid distribution effectiveness following natural disaster events, using the 2015 Nepal Earthquake as a case study
    - **Industry Partner:** Initiated a partnership with Simprints to test the claim that their biometric identification technology can improve aid effectiveness
    - **Methodology:** Arranged a three-week field visit to Nepal to execute 32 semi-structured interviews with stakeholders in the disaster recovery system including Nepalese government agencies, international NGOs, local NGOs, and aid beneficiaries. Coded interview data to develop qualitative and quantitative data
    - **Outcome:** Concluded that technology-based identification methods can lead to more effective aid distribution when an organized governance structure and sound preparedness policies are in place
- Michigan State University** **May 2011–Jun 2014**
- **Undergraduate Research Project:** *Application of Remote Piezoelectric Sensors to Roadway Bridges* May 2014–Jun 2014  
Advisor: Dr. Nizar Lajnef, Department of Civil & Environmental Engineering
    - Compared three bridge sensor adhesives for fatigue strength, weatherability, and application consistency
    - Created a repeatable testing methodology to test fatigue strength
    - Operated an Instron machine to test the durability of the adhesives under fatigue load cycles
  - **Undergraduate Research Project:** *Non-Destructive Evaluation of a High-Strength Composite Material* Jun 2013–Jul 2013  
Advisor: Dr. Mahmood Haq, Department of Mechanical Engineering
    - Measured the growth of damage of impacted composite materials under tensile loading using ultrasound and infrared techniques
    - Collaborated with a research group at the Indian Institute of Technology – Madras in Chennai, India
    - Exhibited research findings in summer project report

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- **Undergraduate Research Project: *Virtual Testing Laboratory for Structural Materials*** Jan 2012–May 2013  
Advisor: Dr. Rigoberto Burgueño, Department of Civil & Environmental Engineering
  - Developed an educational tool with six online modules to assist civil engineering students in their understanding of structural material behavior
  - Heavily instrumented unreinforced and reinforced concrete specimens for six loading configurations
  - Streamed data to an MSU server with goals of uploading to NEEShub for world-wide access
  - Tried educational tool with a civil engineering class and extracted next steps for future improvements
- **Undergraduate Research Project: *Seismic Design of Slender Reinforced Bridge Columns*** May 2011–Dec 2011  
Advisor: Dr. Rigoberto Burgueño, Department of Civil & Environmental Engineering
  - Assisted in the instrumentation and construction of a 2' x 24' concrete bridge column tested under seismic loading
  - Analyzed data from a national earthquake engineering database (Pacific Earthquake Engineering Research)
  - Learned finite element simulation techniques through the Abaqus program
  - Results from the research contributed to a master's thesis and doctorate dissertation

## Work Experience

### Kimley-Horn – Land Development Civil Engineering Analyst Jan 2017–May 2019

- Designed stormwater management systems for four commercial and multi-family projects to meet local requirements for 1, 2, 10 and/or 100-year storm events
- Researched site development requirements and created engineering design drawings for 40+ projects across 14 states
- Collaborated with developers, land use attorneys, architects, and surveyors to meet detailed jurisdictional requirements
- Drafted contracts, established project budgets, and monitored profitability for five commercial projects
- Selected to join the company's new DC office to better manage projects and implement an office organization strategy
- Networked with existing clients and potential partners to promote the company and pursue future projects
- Mentored and trained new employees to increase efficiency of projects and promote career development
- Organized 10 office activities as a member of the VP of Fun Committee while managing a \$22,000 budget

### CAWST – Judge Business School Consultancy Project – Project Manager Jan 2016–Mar 2016

- Utilized advanced web research methods to identify gaps in the decentralized sanitation market in Urban India for the Centre for Affordable Water and Sanitation Technology (CAWST)
- Developed a database to identify 51 stakeholders in education, training, and implementation of decentralized sanitation systems in Delhi, Bangalore, Ahmedabad, and Chennai
- Highlighted gaps in the existing market and recommended partner organizations for future work
- Client: Tommy Ngai, PhD, CAWST

### Bridges to Prosperity – Bridge Corp Fellow Jan 2015–Jun 2015

- Independently performed a needs assessment survey of 60 potential pedestrian bridge sites in rural Nicaragua
- Created the organization's first needs assessment database for technical and social data
- Arranged meetings and site visits with the local Nicaraguan government officials in Spanish
- Recommended bridge sites to pursue and partnerships with some local governments
- Liaised between an American volunteer group and a local Nicaraguan village during the construction of a 100-meter pedestrian bridge in El Pueblito, Nicaragua

## Teaching Experience

### Technion–Israel Institute of Technology – Study Abroad Course Staff Member Jul-Aug 2014, 2019

- Lecturer for *Engineering for Developing Communities* course in Mek'ele, Ethiopia Jul 2019-Aug 2019
  - Co-Taught 4-week intensive course with 27 students from Canadian, Ethiopian, and Israeli universities
  - Lectured on 9 topics, including Behavior Change Communication, Problem Trees, Solution Trees, Capacity & Vulnerability Analysis, Multi-Criteria Decision Analysis, Logframe Development, Systems Thinking, Cross-Cultural Communication, and Disaster Management & Displacement
  - Assisted lectures including Intro to Sustainability, Intro to Appropriate Technologies, SWOC Analysis, Participatory Community Appraisal, Financial Planning, Group Dynamics, Working with an Interpreter, and a series of Ethiopian history, geography, and culture lectures
  - Mentored a team of 9 students to perform a 'holistic community appraisal' in a local village over one week

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- Teaching Assistant for *Engineering for Developing Communities* course in Shantou, China Jul 2014–Aug 2014
  - Supported the 4-week intensive course with 30 students from American, Canadian, Chinese, and Israeli universities in the same topics as the 2019 Ethiopia course (see above)
  - Selected as a staff member based on impressive work as a student during the 2013 course in Nepal

## Michigan State University – Math Department Assistant Sep 2010–May 2011

- Tutored ~ 20 students twice weekly in pre-college, 100- and 200-level mathematics courses
- Proctored trigonometry quizzes and tests biweekly and graded final exams

## Leadership Experience

### Engineers Without Borders - University of Delaware – Supporting Advisor Sep 2019–Present

- Mentored executive board members to guide organizational decision-making and also personal career decisions
- Supported logistical planning and preparations for the international student travel team

### Clara Vista – Executive Board Member & Program Committee Volunteer Aug 2015–Present

- Analyzed holistic community survey data to identify and prioritize the needs of the rural community in Venado, Costa Rica
- Elected to the Board for my ability to provide practical solutions for organizational and program-related issues
- Supported recruitment activities, financial planning, fundraising, and administrative tasks

### American Society of Civil Engineers - MSU Student Chapter President Jan 2012–Dec 2013

- Restructured the nearly non-existent organization to be more beneficial for MSU civil engineering students
- Coordinated with board members, faculty, speakers, and outside organizations to facilitate over 25 events
- Raised membership from 20 members to 76 members within first year as president

### MSU Steel Bridge Team - Captain Aug 2012–May 2013

- Spearheaded new bridge selection process and team organization, resulting in MSU's first regional win since 1992
- Raised over \$15,000 in one month for participation in national competition
- Utilized the MASTAN2 program and cost-benefit analysis to select the bridge design
- Learned new fabrication skills such as welding, drilling, grinding, and sawing steel pieces

### Other Leadership Positions:

- St Edmund's College Boat Club – Coxswain Nov 2015–Jun 2016
- Staff & Student MPhil Liaison Committee – Student Representative Nov 2015–Aug 2016
- MSU Concrete Canoe Team – Structural Analysis Officer Sep 2012–Apr 2014
- MSU Society of Women Engineers – Outreach Sub-Committee Oct 2013–Apr 2014
- MSU Student Engineering Council – Engineering Studies Committee Student Representative Sep 2011–May 2013
- MSU Student Engineering Council – Presidents Retreat Director Apr 2013–Nov 2013
- MSU American Society of Civil Engineers – Secretary Jan 2011–Dec 2011

## National Awards

|  |          |   |          |
|--|----------|---|----------|
| ASCE Arthur S Tuttle Fellowship              | May 2015 | ASCE Lawrence & Francis Cox Scholarship | Apr 2013 |
| Delta Scholarship Award for Excellence       | May 2015 | ASCE Student Leadership Award           | Mar 2013 |
| Brother Barry Austin Chi Epsilon Scholarship | Apr 2014 | ASCE New Faces of Engineering           | Jan 2013 |
| AISC Education Foundation Scholarship        | Aug 2014 | NSPE Steinman Scholarship Award         | Jul 2012 |

\*With an additional 17 regional and local awards totaling to \$70,000

## Additional Skills

- **Certifications:** NCEES Engineering in Training
- **Skills:** Proficient in AutoCAD, MATLAB, Microsoft Office, and Vensim
- **Membership:** Urban Land Institute, American Society of Civil Engineers
- **Language:** Limited working proficiency of Spanish, Elementary proficiency of Portuguese