

PROFESSIONAL SUMMARY

Accomplished structural engineer, educator, and entrepreneur with over ten years of structures experience involving fiber-reinforced polymers (FRP) composite materials; in both aerospace and civil applications. Possesses a strong research background in nondestructive evaluation (NDE) and structural health monitoring (SHM). Has performed engineering work with NASA, North Carolina State University and currently, bridge design, inspection and analysis at Simpson Engineers & Associates. Also serves as Founder and President of STEMedia Incorporated, a digital media initiative that provides creative and inspirational content for the science, technology, engineering and math (STEM) community.

EDUCATION

North Carolina State University, Raleigh, NC

- PhD, Structural Engineering & Mechanics (2015)

University of Alabama in Huntsville, Huntsville, AL

- Masters, Civil Engineering (2011)
- Bachelors, Civil Engineering (2009)

Oakwood University, Huntsville, AL

- Bachelors, Applied Mathematics (2009)

WORK EXPERIENCE

Simpson Engineers & Associates

June 2013-Present

Bridge Design Engineer

- Updated and converted internal analysis tools to Load Resistance Factor Design (LRFD) code compliance.
- Conducts state bridge inspections, performing structural analysis and load ratings for a wide variety of bridges throughout North Carolina.
- Coordinates with a team of engineers and technicians to create and review design calculations, specifications and drawings for bridges, culverts and other transportation structures.
- Contributes to structural engineering project success of various designs involving steel girders, cored slabs, box beams, pre-stressed concrete beams and retaining walls.
- Leads in new business pursuits and client presentations for firm's nascent FRP composite strengthening design services.
- Provides technical support to NCDOT for FRP composite strengthening feasibility, application and installation by contractors and field engineers.
- Addresses internal and external inquiries to deliver projects effectively, meeting deadlines and priorities.

STEMedia Incorporated

2012-Present

Founder and President

- Founded with mission to elevate and inspire underrepresented technical & creative talent in the STEM fields.
- Established partnerships with corporations, academics institutions and organizations to conduct outreach events and campaigns.
- Create and regularly coordinates programs/projects, focused on increasing sales and revenue for video production and community events, while building and sustaining productive customer relationships.

- Manages distributed teams of technical and creative professionals, both domestically and overseas, to achieve unified progress through clear verbal and written communication and direction across sales, marketing and business development.
- Provides ongoing technical expertise and leadership in the areas of creative writing, social content creation, video production, digital marketing, online learning and student engagement.

NC State University Constructed Facilities Laboratory

Aug 2011-May 2015, Summer 2018

Structural Engineering Researcher

- Lecturer and manager of labs in Mechanics of Materials, Steel Design, and Construction Materials courses
- Developed comprehensive research program for monitoring the quality of FRP composite materials in civil and aerospace structures.
- Provided education and training to students, staff and clients on complex topics and industry-related projects.
- Pursued funding sources, evaluated and improved research procedures, and rendered specialized contribution to existing laboratory activities.
- Coordinated project tasks and provided support training for feasibility assessments, experimental design, fabrication/installation, and mechanical testing.
- Performed structural nondestructive evaluation (NDE) using Infrared Thermography (IRT), Particle Image Velocimetry (PIV) and electrical strain gages.
- Successfully completed dissertation on the application, testing and analysis of FRP composite strengthening.

NASA Marshall Space Flight Center

May 2003-Aug 2011

Engineering Research Apprentice

- Designed and conducted experimental studies on structural health monitoring of FRP composite materials.
- Utilized fiber Bragg grating (FBG) optical sensors for damage detection through strain and acoustic emission measurements, along with applying problem solving skills to detect and correct false measurements.
- Studied manufacturing techniques such as wet lay-up, vacuum bag infusion, autoclave oven, and filament winding of composite over-wrapped pressure vessels (COPV).
- Analyzed and effectively interpreted experimental data from various laboratory tests.
- Organized reports and project presentations for supervisors furnished in written, oral or diagram form.
- Directed the set up of testing equipment and programmed interfaces between lab instruments; such as oscilloscopes, laser light sources, data acquisition systems and power supplies using LabVIEW software.

VOLUNTEER EXPERIENCE

Engineering Ministries International

Summer 2013

Structural Engineering E.I.T.

- Traveled with a team of five design professionals to Manchay, Peru to provide services for a local community center.
- Assessed the structural condition of the existing buildings and provided retrofit recommendations according to their desired plans.
- The trip culminated with a presentation to the organization's stakeholders and a final written report on feasibility for contractors.

Engineering Ministries International

Summer 2010

Structural Engineering E.I.T.

- Worked on a team of ten engineers and architects in the designing of a \$1.8 million conference center and campus for MELTI Christian ministry in Alexandria, Egypt.
- Participated in meetings with the clients to define project parameters and establish design specifications.

- Produced AutoCAD design drafts of the site master plan, building layouts, and completed structural engineering drawings.
- Preliminary design of concrete slabs and beams for 10,000 sq. ft. assembly hall.
- Prepared final project design review presentation for stakeholders.

All Nations Center of Excellence

May 2009 - Aug 2011

Manager

- Developed tutoring program for local K-12 students in the neighborhood
- Coordinated volunteers and arranged schedules for serving student population
- Oversaw General Education Development (GED) completion program with partnering community college.

PUBLICATIONS

Mabry, N. J., Seracino, R., & Peters, K. J. (2018, February 28). The Effects of Accelerated Freeze-Thaw Conditioning on CFRP Strengthened Concrete with Pre-Existing Bond Defects. *Journal of Construction and Building Materials*, Volume 163

Mabry, N. J., Peters, K. J., & Seracino, R. (2015, September 2). Pulse Phase Thermography Inspection of Bond Defects in Environmentally Conditioned FRP-to-Concrete Specimens. *Structural Health Monitoring 2015*.

Mabry, N. J. (2015, March 17). Detection of Bond Defects in Carbon Fiber Reinforced Polymer Strengthened Concrete Using Pulse Phase Thermography [Doctoral Dissertation]. *North Carolina State University*.

Mabry, N. J., & Seracino, R. (2015, January 5). Depth Detection of Bond Defects in Multilayered Externally Bonded CFRP-to-Concrete Using Pulse Phase Thermography. *ASCE Journal of Composites for Construction*, Volume 19 (6).

Mabry, N. J. (2011, June 30). Acoustic Emission Detection in Carbon Composite Materials Using Fiber Bragg Grating Optical Sensors [Master's Thesis]. *The University of Alabama in Huntsville, ProQuest Dissertations Publishing*.

Mabry, N. J., Banks, C. E., Toutanji, H., & Seif, M. (2011, April 15). Acoustic Emission Felicity Ratio Measurements in Carbon Composites Laminates Using Fiber Bragg Grating Sensors. *Proc. SPIE 7982, Smart Sensor Phenomena, Technology, Networks, and Systems 2011*.

Mabry, N. J., Banks, C. E., Walker, J. L., Russell, S., Roth, D., & Wilson, M. (2010, May 9). Acoustic Emission Measurement with Fiber Bragg Gratings for Structure Health Monitoring. *SPIE Smart Structures | International Society for Optical Engineering*.

SKILLS & SOFTWARE

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| ● Research | ● Drafting (AutoCAD/MicroStation basics) | ● Smartsheet |
| ● Public Speaking | ● Finite Element (RISA 3D) | ● Adobe Acrobat |
| ● Teaching/Training | ● CONSPAN (LEAP Bridge Design) | ● Microsoft Suite (Outlook, Word, PowerPoint, Excel) |
| ● Leadership | ● ET Culvert | |

ORGANIZATIONS

- American Society of Civil Engineers (ASCE)
- National Society of Black Engineers (NSBE)

AWARDS & CERTIFICATIONS

National Council of Examiners for Engineering and Surveying

- Fundamentals of Engineering (E.I.T.) Certification

National Highway Institute

- “Safety Inspection of In-Service Bridges” (National Bridge Inspection Standards) Certification

National Society of Black Engineers (NSBE) Professionals

- Technical Excellence Ambassador Award (2017)
- Entrepreneurship S.I.G. Member of the Year Award (2016)

National Academy of Engineering (NAE)

- Engineering For You (E4U3) Best Overall & People's Choice Award (2016)

Intel Engineering STAY WITH IT Campaign

- National Grand Prize Winner (2012)

PRESENTATIONS & KEYNOTES

Envision Science Academy – President & Board Chair Invitational

- Career Day Keynote Speaker, Wake Forest, NC, May 2018

National Summer Transportation Institute – Elizabeth City State University

- Closing Ceremony Keynote, Elizabeth City, NC, July 2017

Emerging Scholars Academy – North Carolina State University

- Morning Motivation Keynote, Raleigh, NC, June 2017

“Rewriting the Narrative with Science” - Union of Concerned Scientists

- Webinar Presenter on *Compelling Ways to Share your Science Story*, February 2017

Freedom Classic Festival – STEM-ED Connects Speaker

- Elkhardt-Thompson Middle School, Richmond, VA, January 2017

Communicating the Enthusiasm and Impact of Engineering Using Spoken Word Poetry

- American Society of Engineering Education (ASEE) Conference Workshop, Columbus, OH, June 2016

Diversity Leadership Symposium – NCSU College of Engineering

- Luncheon Keynote Speaker Address, Raleigh, NC, April 2016

Creatively Enhancing Your Leadership Style – Leadership Development Series

- NCSU Center for Leadership, Ethics & Public Service, Raleigh, NC, March 2016
- NSBE National Convention Workshop Presentation, Boston, MA, April 2016