

Michael L. Whiteman II, Ph.D.

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Post Doctoral

Department of Civil and Environmental Engineering
Howard University, 2300 Sixth Street, NW
Washington, D.C. 20059

EDUCATION

University of Maryland Ph.D. Civil Engineering (<i>Structures</i>) <i>Advisor: Dr. Brian M. Phillips</i>	College Park, MD <i>May 2020</i>
M.S. Civil Engineering (<i>Structures</i>)	<i>May 2017</i>
B.S. Civil Engineering (<i>Structures/Geotechnical</i>)	<i>December 2015</i>
St. Mary's College of Maryland B.A. Physics (<i>Applied Physics Concentration</i>), minor in Mathematics	St. Mary's City, MD <i>December 2015</i>

RESEARCH INTERESTS

- Artificial intelligence (AI)-driven structural health monitoring to inform repair and replacement decisions
- Cyber-physical modeling of civil infrastructure performance to achieve robustness against natural hazards
- Gradient-based and stochastic optimization of structural efficiency and performance of civil infrastructure

RESEARCH EXPERIENCE

Howard University <i>Post Doctoral</i>	Washington, D.C. <i>October 2020 – Present</i>
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- Developed numerical tools in MATLAB and Python to support a machine learning (ML) and computer-vision based approach to structural health monitoring
- Successfully developed a computational platform prototype integrating a ML model, video analytics module, and experimental data for in-situ damage detection and localization of civil infrastructure
- Lead the selection, instrumentation, and data collection for civil structures subject to dynamic loading
- Disseminated research results to international engineering communities through formal presentations
- Wrote a technical conference paper for publication and assisted with a \$5M project proposal (pending)

University of Maryland <i>Graduate Research Assistant</i>	College Park, MD <i>January 2016 – May 2020</i>
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- Developed numerical and experimental tools in MATLAB and Python to support cyber-physical systems (CPS) approaches to wind hazards engineering
- Successfully constructed a cyber-physical framework integrating numerical optimization into standard boundary layer wind tunnel testing considering wind hazards
- Lead the design, fabrication, and instrumentation of mechatronic wind tunnel building models
- Coordinated wind tunnel experiments at the University of Maryland and University of Florida
- Estimated full-scale building phenomena using Kalman filtering and the maximum likelihood function
- Prepared and delivered presentations summarizing research findings to international audiences
- Wrote peer-reviewed technical journal papers and conference papers for publication

Naval Air Warfare Center Aircraft Division <i>Applied Physics Intern</i>	Patuxent River, MD <i>November 2012 – May 2013</i>
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- Designed and fabricated portable magneto-optical trap unit in SolidWorks meeting all specifications
- Constructed highly sensitive sensors using lasers and magnetic fields to cool and position atoms

TEACHING AND MENTORING EXPERIENCE

Howard University <i>Mentor, 3 undergraduate students</i>	Washington, D.C. <i>October 2020 – Present</i>
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University of Maryland <i>Guest Lecturer, Design of Steel Structures</i>	College Park, MD <i>March 2019</i>
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- Instructed lecture on analysis and design of compression members to class of 40 students

TEACHING AND MENTORING EXPERIENCE (CONTINUED)

University of Maryland

College Park, MD

Tutor, A. James Clark WiseGuy Tutoring

August 2015 – May 2016

- Designed and implemented personalized exercises to facilitate academic improvement of 5 students
- Provided tutoring services for Fluid Mechanics and Dynamics

St. Mary's College of Maryland

St. Mary's City, MD

Teaching Assistant, Fundamental of Physics I

August 2012 – December 2012

- Tutored on an individual basis to ensure students understood quantitative and theoretical concepts
- Aided in teaching of lab sessions, exam preparation sessions, and course recitation sessions

PEER-REVIEWED JOURNAL PUBLICATIONS

Whiteman, M. L., Fernández Cabán, P. L., Phillips, B. M., Masters, F. J., Bridge, J. A., & Davis, J. R. "Mitigating vortex-induced vibrations of a tall building in a wind tunnel using a controllable active fin system." *Journal of Wind Engineering and Industrial Aerodynamics* (in review).

Fernández-Cabán, P. L., **Whiteman, M. L.**, Phillips, B. M., Masters, F. J., Davis, J. R., & Bridge, J. A. (2020). Cyber-physical design and optimization of tall building dynamics using aeroelastic wind tunnel modeling. *Journal of Wind Engineering and Industrial Aerodynamics*, 198, 104092.

Whiteman, M. L., Fernández-Cabán, P. L., Phillips, B. M., Masters, F. J., Bridge, J. A., & Davis, J. R. (2018). Multi-objective optimal design of a building envelope and structural system using cyber-physical modeling in a wind tunnel. *Frontiers in Built Environment*, 4, 13.

Whiteman, M. L., Phillips, B. M., Fernández Cabán, P. L., Masters, F. J., Bridge, J. A., & Davis, J. R. "Optimal design of structures using cyber-physical wind tunnel experiments with mechatronic models." *Journal of Wind Engineering and Industrial Aerodynamics* 172, 441-452.

CONFERENCE PROCEEDINGS (Presenter shown in **bold**)

Whiteman, M. L., Fernández-Cabán, P. L., Marin, C. C., Tezcan, J., Wu, X., Cheng, Q. S. (2021, May). Detection and classification of damages to civil infrastructure using a video-monitoring tool. In *The 6th American Association for Wind Engineering Workshop (6th AAWE Workshop)*.

Whiteman, M. L., Fernández-Cabán, P. L., Phillips, B. M., Masters, F. J., Bridge, J. A., & Davis, J. R. (2019, September). A cyber-physical framework for optimizing the performance of wind-sensitive structures in a boundary layer wind tunnel. In *The 15th International Conference on Wind Engineering (ICWE15)*.

Whiteman, M. L., **Fernández-Cabán, P. L.**, Phillips, B. M., Masters, F. J., Bridge, J. A., & Davis, J. R. (2019, June). Optimal design of tall buildings using cyber-physical aeroelastic wind tunnel experiments. In *Engineering Mechanics Institute Conference 2019 (EMI 2019)*.

Whiteman, M. L., Fernández-Cabán, P. L., Phillips, B. M., Masters, F. J., Bridge, J. A., & Davis, J. R. (2019, June). Optimization of an active tall building envelope system using cyber-physical aeroelastic wind tunnel experiments. In *EMI 2019*.

Whiteman, M. L., Fernández-Cabán, P. L., Phillips, B. M., Masters, F. J., Bridge, J. A., & Davis, J. R. (2019, April). A cyber-physical framework for structural optimization of tall buildings in a boundary layer wind tunnel. In *Structures Congress 2019*.

Whiteman, M. L., Fernández-Cabán, P. L., Phillips, B. M., Masters, F. J., Bridge, J. A., & Davis, J. R. (2018, September). Optimal design of a low-rise structure in a wind tunnel using deterministic and metaheuristic algorithms. Presented at *Tornado Hazard Wind Assessment and ReducTion Symposium (THWARTS)*.

Whiteman, M. L., **Fernández-Cabán, P. L.**, Phillips, B. M., Masters, F. J., Bridge, J. A., & Davis, J. R. (2018, April). Optimal design in wind engineering using cyber-physical systems and non-stochastic search algorithms. In *Structures Congress 2018*.

Whiteman, M. L., **Phillips, B. M.**, Fernández-Cabán, P. L., Masters, F. J., Rice, J. A., & Davis, J. R. (2017, May). Cyber-physical systems approach to optimization in wind engineering: parapet wall design. In *The 13th Americas Conference on Wind Engineering (13ACWE)*.

FELLOWSHIPS AND AWARDS

- *Best Paper Presentation at the 6th AAWE Workshop*; AAWE; 2021
- *Bechtel Fellowship Fund*; University of Maryland (UMD); 2018 and 2019
- *Ann G. Wylie Fellowship*; UMD; 2019
- *Outstanding Graduate Assistant Award*; UMD; 2018

FELLOWSHIPS AND AWARDS (CONTINUED)

- *Rattan L. Khosa '71 Graduate Scholarship in Structural Engineering*; UMD; 2018
- *Higher Education Scholarship*; Choctaw Nation of Oklahoma; 2011 – 2018
- *Award of Excellence*; National Capital Chapter of the American Concrete Institute; 2016
- *Civil Fundamentals of Engineering Exam (EIT) Passed*; Maryland Department of Labor; 2015
- *Maryland Senatorial Scholarship*; Maryland Higher Education Commission; 2012 – 2015
- *Maryland House of Delegates Scholarship*; Maryland Higher Education Commission; 2012 – 2013
- *St. Mary's Academic Achievement Scholarship*; St. Mary's College of Maryland; 2011 – 2013
- *Minority Scholar Honorable Mention*; American Physical Society; 2012
- *Eagle Scout*; Boy Scouts of America; 2011

PROFESSIONAL ORGANIZATIONS

- American Concrete Institute (ACI); 2015
- American Society of Civil Engineers; 2014
- American Physical Society; 2012
- Chi Epsilon; 2015