D. Michael Senter

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Education

University of North Carolina at Chapel Hill   **Chapel Hill**
Doctor of Philosophy (Ph.D.) in Mathematics   *2015–2021*

University of North Carolina at Chapel Hill   **Chapel Hill**
Graduate Certificates   *2015–2021*
NIH Big Data to Knowledge (BD2K)
Bioinformatics and Computational Biology (BCB)

University of Utah   **Salt Lake City**
Bachelor of Science in Mathematics   *2012–2015*

Experience

SAS   **Cary, NC**
Analytics Software Tester   *2021–Present*
Work with an agile, multinational team of testers, product managers, developers, and research statisticians to validate features of the SAS Solution for IFRS 17. Devise, implement, and execute independent tests and procedures to verify the numerical accuracy of the solution. Write and review technical documentation for both internal and external stakeholders. Automate testing through the creation of unit tests in a CI/CD framework. Write programs to support the testing effort in SAS, SQL, Python, Bash and Go. Interact directly with product managers, industry experts, and developers to test and demo new features.

UNC-CH School of Medicine   **Chapel Hill, NC**
Research Fellow   *2021–2022*
Provide statistical analysis and consultation for retrospective cohort studies with the SUDDEN group using SAS 9 and Python. Mentor medical students on experimental design, data entry and validation, as well as appropriate interpretation of study results. Supervise a group of post-graduate, graduate, and undergraduate statisticians paired with medical students in the SUDDEN team.

SAS   **Cary, NC**
Data Science Intern   *2019–2021*
My internship within SAS Education was focused on integrating open source technologies with SAS' free academic software, developing supplemental tutorials and applied content for customers and establishing the SAS Academic GitHub. Leveraged open-source offerings in Python, such as Pandas and Scikit, and integrated them with SAS 9 and SAS Viya technology via the SASPy package, to which I have contributed a new method, and the SWAT package. Developed tutorials for various academic cloud offerings, such as SAS OnDemand for Academics and SAS Viya for Learners.

UNC Chapel Hill   **Chapel Hill, NC**
Miller Lab Group   *2015–2021*
Executed fully-coupled fluid-structure interaction simulations using the immersed boundary (IB) method with software written in Python, Matlab, and C++ on HPC clusters running Red Hat Enterprise Linux. Analyzed the resulting large data sets using custom Python, Matlab, and Julia scripts to interact with data stored in VTK and HDF5 formats. Visualization of results from simulations using VisIt and Paraview as well as Matplotlib. Developed a Python software package to semi-automate the creation of 2D finite difference meshes for IB software simulation from image data using image recognition and optimization techniques. Mentored several undergraduate students and helped train other graduate students.

UNC Chapel Hill **Chapel Hill, NC**

Graduate Teaching Fellow *2015–2021*

Instructor on record with full duties for college algebra (MATH 110), math modeling (MATH 119), and calculus III (MATH 233). Recitation instructor for calculus I and II (MATH 231 & 232). Responsibilities included teaching of recitation sections, advising students, and the development, administration, and grading of exams. Teaching assistant for Math Modeling in the Life Sciences (MATH 564) and Math Modeling Lab (BCB 718). Duties included advising students on model design and supporting model development in Python and Matlab.

University of Utah **Salt Lake City, UT**

Mathematics Department REU *2013–2015*

Developed Matlab scripts that implement a novel, statistically exact covariance based algorithm for mean first passage time in complex fluids. Ported this code to a parallel version of the algorithm in C++ that produced a more than 20x speed improvement compared to the Matlab version.

Computing Skills

Scripting Languages: Python, Matlab, Julia, R

Compiled Languages: C++, Go

SAS Certified Specialist: Base Programming Using SAS 9.4

Typesetting: LaTeX, Markdown

Operating Systems: Linux, Windows, Mac OS

Other Skills: Git, SQL, Docker, Bash, Azure

Publications

D.M. Senter, N.A. Battista, B. Guy, C. Zhang, K. Ozalp, K. Ebke, V. Pasour, and L.A. Miller. The hydrodynamics of metachronal paddling in brine shrimp. *Bioinspiration & Biomimetics*, 2022 in preparation.

A. Kothari, E. Senter, D.M. Senter, A.P. Cesmat, S. Keen, and R.J. Simpson. Association of heart failure and food deserts with sudden death. In *The American Heart Association Annual Conference*, 2022 submitted.

A. Doshi, E. Senter, O. Queen, D.M. Senter, S. Keen, K. Shartle, and R.J. Simpson. Family history and chronic medical conditions associated with sudden death among working age adults. In *The American College of Preventive Medicine Annual Conference*, Denver, CO, June 2022.

S. Raghunathan, D.M. Senter, E. Senter, S. Keen, K. Shartle, and R.J. Simpson. Former incarceration as a risk factor for COVID-19 associated sudden death. In *American College of Cardiology Scientific Session*, Washington, DC, April 2022.

H. Vrooman, E. Senter, K. Shartle, S. Keen, C. Sauter, D.M. Senter, and R.J. Simpson. Housing insecurity: Effects on sudden death and interaction with mental illness. In *The American College of Cardiology Scientific Session*, Washington, DC, April 2022.

D. Michael Senter. *Immersed Boundary Simulations And Tools For Studying Insect Flight And Other Applications*. PhD thesis, University of North Carolina at Chapel Hill, 2021.

D.M. Senter, D.R. Douglas, W.C. Strickland, S.G. Thomas, A.M. Talkington, L. Miller, and N.A. Battista. A semi-automated finite difference mesh creation method for use with immersed boundary software IB2d and IBAMR. *Bioinspiration & Biomimetics*, 2020.

C. Hohenegger, R. Durr, and D.M. Senter. Mean first passage time in a thermally fluctuating viscoelastic fluid. *Journal of Non-Newtonian Fluid Mechanics*, 242:48–56, 2017.