REBEKAH WHITE

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EDUCATION

North Carolina State University *August 2016 - Present*
PhD Applied Mathematics Graduate Program *Expected date of graduation: May 2021*
Master's in Applied Mathematics *August 2016 - December 2018*
Advisors: H.T. Banks, PhD & Alen Alexanderian, PhD

East Tennessee State University *August 2012 - Dec 2015*
Bachelor's of Science in Mathematics

RESEARCH INTERESTS

General: Optimization, Inverse Problems, Numerical Analysis, Scientific Computing, Uncertainty Quantification, Mathematical Modeling, Physics, Engineering and Life Sciences Applications

Specific: Parameter Estimation and Model Calibration, Local and Global Sensitivity Analysis, Optimal Experimental Design Problems, Non-destructive Interrogation Techniques for Analyzing Heterogeneous Materials, Quantifying Degradation in Bone

GRADUATE COURSEWORK

North Carolina State University

Numerical Analysis I, II	Mathematical Modeling I, II	Control Theory I, II
Uncertainty Quantification	Functional Analysis	Matrix Theory I , II
Probability	Cryptography	Measure Theory

ACADEMIC APPOINTMENTS

North Carolina State University *Raleigh, NC*
Research Assistant — Funded by NSF Graduate Research Fellowship Program (GRFP) *2018–present*
Research Assistant – Center for Research in Scientific Computation *2016 - 2018*

OTHER PROFESSIONAL EXPERIENCE

Applied Research Associates (ARA), *Albuquerque, NM* *May 2019 - August 2019*
- Worked on quantifying uncertainty in warhead properties
- Worked on modeling high-strength concrete for use in penetration simulations
- Two publication resulted from this summer internship; see [3,12]

AWARDS/HONORS

NSF-GFRP Fellowship *2018 - present*
GAANN Fellowship *2016 - 2017*
Society for Industrial and Applied Mathematics
- SIAM Student Travel Award *March 2020*
Awarded for the Uncertainty Quantification conference
East Tennessee State University
- The Honors in Discipline Program
Scholarship program that requires honors classes and thesis *August 2012 - December 2015*

PUBLICATIONS

Peer-reviewed journal articles:

1. **R.D. White**, A. Alexanderian, O. Yousefian, Y. Karbalaeisadegh, K. Bekele-Maxwell, A. Kasali, M. Talmant, Q. Grimal, H.T. Banks, M. Muller. *Using Ultrasonic Attenuation in Cortical Bone to Infer Distributions of Pores.* In Progress to be submitted to *Inverse Problems.*

2. **R.D. White**, O. Yousefian, A. Alexanderian, H.T. Banks, M. Muller. *Inferring pore radius and density from ultrasonic attenuation using physics-based modeling.* Journal of the Acoustical Society of America. Submitted June 2020.

3. **R.D. White**, D. Fajardo, C. Doolittle, H.T. Banks. *Quantifying Uncertainty in Warhead Design: How machining uncertainty affects volume and center of mass.* Journal of Verification, Validation, and Uncertainty Quantification. In Review. Dec 2019.

4. O. Yousefian, **R.D. White**, H.T. Banks, M. Muller. *Estimation of parameters quantifying porosity in random porous structures using ultrasonic attenuation: Solving the inverse problem.* The Journal of the Acoustical Society of America. Vol 145 (3), 2019.

5. H.T. Banks, R.A. Everett, N. Murad, **R.D. White**, J.E. Banks, B.N. Cass, J.A. Rosenheim. *Optimal design for dynamical modeling of pest populations.* Mathematical Biosciences & Engineering, Vol 15 (4), 2018.

6. T. Rieger, R. Allen, L. Bystricky, Y. Chen, G. Colopy, Y. Cui, A. Gonzalez, Y. Liu, **R.D. White**, R.A. Everett, H.T. Banks, C.J. Musante. *Improving the generation and selection of virtual populations in quantitative systems pharmacology models.* Progress in Biophysics and Molecular Biology. Vol 139, 2018.

7. **R.D. White**. *A Physiologically-Based Pharmacokinetic Model for Vancomycin.* SIAM Undergraduate Research Online (SIURO). Vol 9, 2016.

Conference proceedings:

9. **R.D. White**, O. Yousefian, A. Alexanderian, M. Mulluer. *Modeling frequency dependent ultrasound attenuation in cortical bone: solving direct and inverse problems.* IEEE International Ultrasonics Symposium (IUS), 2020.

10. O. Yousefian, **R.D. White**, H.T. Banks, M. Muller. *Inferring porosity from frequency dependent attenuation in cortical bone mimicking porous media.* IEEE International Ultrasonics Symposium (IUS), 2018.

11. O. Yousefian, **R.D. White**, H.T. Banks, M. Muller. *Ultrasonic attenuation spectroscopy and dispersion characteristics in cortical bone.* IEEE International Ultrasonics Symposium (IUS), 2017.

Technical Reports:

12. **R.D. White**, D. Malechuk, A. Oliphant, H.T. Banks. *Optimizing a Concrete Material Model for Performance in Ballistic Impact Simulations.* Journal of Engineering Materials and Technology. Submitted. Feb 2020.

INVITED TALKS AND PRESENTATIONS

International Ultrasonics Symposium September 2020
IEEE *Virtual Talk*

"Modeling Frequency Dependent Ultrasound Attenuation in Cortical Bone: Solving Direct and Inverse Problems"

WCCM-ECCOMAS July 2020
Covid-19 Cancellation *Paris, France*

"Modeling frequency Dependent Ultrasound Attenuation in Cortical Bone: Solving Direct and Inverse Problems"

SIAM Uncertainty Quantification March 2020
Covid-19 Cancellation *Munich, Germany*

"Quantifying Uncertainty in Warhead Design: How machining uncertainty affects volume and center of mass"

Applied Math Grad Student Seminar September 2019
North Carolina State University *Raleigh, North Carolina*

"Performance of High Strength Concrete in Ballistic Impact Simulations: A Model Optimization Study"

Conference on Mathematical Methods and Modeling in Engineering and Life Sciences November 2018
Universidad Nacional de San Martín *Buenos Aires, Argentina*

"A physics-based modeling approach to quantifying porosity in cortical bone using ultrasonic attenuation"

42nd SIAM Southeastern Atlantic Sectional Conference March 2018
UNC Chapel Hill *Chapel Hill, North Carolina*

"Inferring the Micro-Architecture of Cortical Bone using Ultrasonic Waves"

Applied Math Grad Student Seminar October 2018
North Carolina State University *Raleigh, North Carolina*

"A physics-based modeling approach to quantifying porosity in cortical bone using ultrasonic attenuation"

Applied Math Grad Student Seminar March 2018
North Carolina State University *Raleigh, North Carolina*

"Inferring the Micro-Architecture of Cortical Bone using Ultrasonic Waves"

2017 STEM Education Conference June 2017
East Tennessee State University *Johnson City, Tennessee*

"Computer Student Interaction"

COMPUTER SKILLS

Programming: *Python, Matlab, Maple, and R*
Operating Systems: *Linux, Mac OS, Windows*
Research Tools: *LaTeX, GitHub, Beamer, Microsoft Office*

REFERENCES

1. Alen Alexanderian, PhD, *alexanderian@ncsu.edu*
2. Ralph Smith, PhD, *rsmith@ncsu.edu*
3. Marie Muller, PhD, *mmuller2@ncsu.edu*
4. Michele Joyner, PhD, *joynerm@mail.etsu.edu*