Emily P. Meissen

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Education

August 2017 — **Ph.D.** University of Arizona, Applied Mathematics — 3.96/4.00
Dissertation Title: *Invading a Structured Population: A Bifurcation Approach*
I present a matrix model of two interacting populations where the resident population has a stable cycle. I use Lyapunov-Schmidt expansions to perform a local bifurcation analysis of coexistence cycles as the resident cycle destabilizes.

May 2014 — **M.S.** University of Arizona, Applied Mathematics — 3.96/4.00

May 2011 — **B.S.** Rensselaer Polytechnic Institute, Mathematics — 3.94/4.00
B.S. Rensselaer Polytechnic Institute, Computer Science — 3.94/4.00

Skills

Computer — C · C++ · MATLAB · LaTeX · Ti*k*Z · Linux/UNIX · Mathematica · Python · Perl · HTML/CSS

Experience

Summer 2015 — **Industrial Mathematical & Statistical Modeling Workshop**
North Carolina State University
Worked in a small group under a mentor from MIT Lincoln Labs. Created a spatial agent-based model of Ebola spread in Python. Individuals were distributed around and traveled to village/city centers according to an exponential distribution with different contact rates between family members and community members. Compared to a non-spatial model and presented and wrote a report on the results.

Summer 2014 — **NSF/JSPS EAPSI Summer Program**
University of Miyazaki, Japan
Analyzed the dynamics of a biologically-motivated 4-dimensional system of differential equations using Mathematica and methods from dynamical systems theory.

Summer 2009 — **Johns Hopkins University Applied Physics Laboratory Internship**
Underwater Acoustics Group (STX)
Analyzed results from experimental data via modeling and MATLAB. Wrote MATLAB functions to support data collection and processing for an upcoming experiment.

Achievements

2014 — *East Asia and Pacific Summer Institute Fellowship*, National Science Foundation and Japan Society for the Promotion of Science

2012-2015 — *National Defense Science and Engineering Graduate (NDSEG) Fellowship*, American Society for Engineering Education, Department of Defense

2011-2012 — *Vertical Integration of Research and Education in the Mathematical Sciences (VIGRE) Fellowship*, University of Arizona, sponsored by the National Science Foundation

2011 — *Summa Cum Laude*, Rensselaer Polytechnic Institute

2011 — *Outstanding Paper*, COMAP Mathematical Contest in Modeling

2010 — *SIAM Prize & Outstanding Paper*, COMAP Mathematical Contest in Modeling

Publications

Meissen, Emily P., Kehinde R. Salau, and Jim M. Cushing. A global bifurcation theorem for Darwinian matrix models. *Journal of Difference Equations and Applications*, 22(8), 2016.