SCOTT EMMONS
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EDUCATION
University of North Carolina at Chapel Hill
BS, *Mathematics* and BA, *Computer Science*. GPA 4.0/4.0   Expected May 2019
GRE 170/170 Verbal, 170/170 Quantitative, 6.0/6.0 Writing

AWARDS AND HONORS
Robertson Scholars Leadership Program ($250,000)   2015 - 2019
- Highly selective undergraduate merit scholarship providing unique "dual citizenship" at UNC and Duke.

Goldwater Scholar ($15,000)   2017 - 2019
- National, research-based scholarship in the natural sciences, mathematics, and engineering.

Alfred Brauer Award   2018
- Granted by UNC's Department of Mathematics "to the undergraduate who… ha[s] demonstrated the greatest ability and shown the greatest promise for achievement in the fields of algebra or number theory."

National Merit Scholar ($2,500)   2015
- Among top 0.6% of PSAT test takers.

Honors Carolina   2015 - 2019
- Selected top 10% of incoming UNC class.

PUBLICATIONS AND PRESENTATIONS
Submitted for Publication
- **Scott Emmons** & Peter J. Mucha: "A Map Equation with Metadata: Varying the Role of Attributes in Community Detection." ***Submitted**, 2018*.

Peer-Reviewed Publications
- Kris Hauser & **Scott Emmons**: "Global Redundancy Resolution via Continuous Pseudoinversion of the Forward Kinematic Map." *IEEE Transactions on Automation Science and Engineering, 2018*.
- **Scott Emmons**, Robert Light, & Katy Börner: "MOOC Visual Analytics: Empowering Students, Teachers, Researchers, and Platform Developers of Massively Open Online Courses." *Journal of the Association for Information Science and Technology (JASIST), 2017*.
- William H. Weir, **Scott Emmons**, Ryan Gibson, Dane Taylor, & Peter J. Mucha: "Post-Processing Partitions to Identify Domains of Modularity Optimization." *Algorithms, 2017*.
- **Scott Emmons**, Mike Gallant, Stephen Kobourov, & Katy Börner: "Analysis of Network Clustering Algorithms and Cluster Quality Metrics at Scale." *PLoS ONE, 2016*.

Oral Presentations
- **Scott Emmons**, Robert Light, & Katy Börner: "MOOC Visual Analytics: Empowering Students, Teachers, Researchers, and Platform Developers of Massively Open Online Courses." Interactive Intelligent Systems Open House. Bloomington, IN, 2015. **Best Presentation Award**
- **Scott Emmons**, Robert Light, & Katy Börner: "MOOC Visual Analytics." Cyberinfrastructure for Network Science Center Open House. Bloomington, IN, 2014.
- **Scott Emmons**: "Mapping the Consumer Product Space." Cyberinfrastructure for Network Science Center Open House. Bloomington, IN, 2013.

RESEARCH EXPERIENCE
Carolina Center for Interdisciplinary Applied Mathematics, *Mucha Group, UNC*   Chapel Hill, NC
Undergraduate Researcher   November 2015 - Present
- Analyzing reachability and concurrency on time-evolving networks to study, for example, the spread of HIV in social networks (ongoing).
- Formulating information-theoretic algorithm incorporating metadata into community detection to meet computational needs of applied researchers (ongoing).
- Developed post-processing methods for community detection in networks to gain insight from large, complex network datasets.

Intelligent Motion Laboratory, *Duke University*   Durham, NC
Undergraduate Researcher   August 2016 - May 2017
- Developed method for the efficient, continuous pseudoinversion of a multivariate function, which has implications for robot motion planning and applications such as teleoperation and surgical robotics.
- Optimized runtime of pseudoinversion algorithm for average of 25x speed increase, enabling the computation of order-of-magnitude greater problem definitions.
- Implemented custom cached database and parallelized, cache-aware algorithms to facilitate analysis at a scale unprecedented for its kind in the existing literature.

Cyberinfrastructure for Network Science Center, *Indiana University*   Bloomington, IN
Research Intern   September 2013 - April 2017
- Collaborated on international research project to map scientific publication.
- Analyzed massively open online course data to empower students, teachers, researchers, and platform developers of massively open online courses.
- Designed studies using statistical computing and visual analytics to advance the fields of network science and online learning dynamics.
- Optimized computational experiments on supercomputer via parallel programming for 100x speed increase
- Led independent research project to map consumer purchasing behavior.
- Reviewed MIT Press books *Visual Insights: A Practical Guide to Making Sense of Data* and *Atlas of Knowledge: Anyone Can Map* to teach sophisticated visual analytics to a general audience.

Arnosti Laboratory, *Department of Marine Sciences, UNC*   Chapel Hill, NC
Research Assistant   October 2015 - February 2016
- Developed interactive software for the hierarchical visualization of microbial community composition data used in making oceanography discoveries.
- Programmed scripts that automated supercomputing workflows for DNA sequencing to increase the research lab's operational efficiency.

Graph and Map Algorithms Group, *University of Arizona*   Tucson, AZ
Visiting Scholar   December 2014 - January 2015
- Collaborated directly with Dr. Stephen Kobourov to design study answering previously unresolved questions in the field of network science.
- Implemented computational experiments on 4 algorithms and 6 metrics that can be applied to research in disciplines ranging from the social sciences to the biological sciences.

PROFESSIONAL EXPERIENCE
Information Technology Services, *University of North Carolina at Chapel Hill*   Chapel Hill, NC
Residential Computing Consultant   August 2017 - May 2018
- Supported on-site IT needs of 70 university students to ensure a high-quality residential experience.
- Solved issues independently and autonomously to provide fast, reliable service to clients.

Robertson Community Coordinators, *Robertson Scholars Leadership Program*   Chapel Hill, NC
Service Committee Member   August 2015 - May 2017
- Organized volunteer opportunities that drove civic engagement amongst Robertson Scholars.
- Oversaw logistics and funding for 4 community service projects that improved local living conditions.

Sparq Creative Solutions, LLC   Bloomington, IN
Cofounder and Owner   December 2013 - December 2015
- Created strategic plans, brand identities, logos, and websites to grow local businesses.
- Consulted with clients to identify needs and plan projects to meet business objectives.
- Formulated contracts and closed sales deals aligning with client goals.
- Identified independent contractors with relevant expertise to exceed client expectations.
- Executed internal business operations by keeping the books, filing taxes, and coding company website to continue efficiently offering high-quality services.

TEACHING AND MENTORING EXPERIENCE
Shanti Bhavan Children's Project   Tamil Nadu, India
Volunteer Teacher   July 2017 - August 2017
- Taught approximately 80 students from families who make less than $2 / day in subjects ranging from English literature to physics to provide an educational foundation towards eliminating the cycle of poverty.
- Mentored 10 students in quantitative subjects such as mathematics and computer science in preparation for national examinations.
- Coached students in preparation for public speaking to an audience of 50 members to develop students' confidence and communication skill.
- Instructed 20 students in resume writing for a Goldman Sachs workshop preparing them to seek and attain high-impact careers.
- Collaborated with school's founder to draft detailed budget proposal requesting hundreds of thousands of dollars per year in funding for new initiative.

Sunflower County Freedom Project   Sunflower, MS
Volunteer Teacher   May 2016 - July 2016
- Developed standard-aligned 8th- and 9th-grade math curriculum designed for under-performing middle school students who sought over the summer to enrich their education.
- Taught two math classes that saw an average increase in performance of 9% on state standard test.
- Developed a three-day coding seminar for middle school students that used active learning with puzzles to introduce the fundamentals of computer science.
- Created spreadsheet framework that will form the basis of future data analytics at the Freedom Project to measure courses' academic impact.
- Led fitness group in dieting and exercise that resulted in average mile time decrease of over 60 seconds
- Coordinated with videographer to film short documentary used in grant proposals.

Life Skills Academy   Bloomington, IN
Cofounder   January 2014 - May 2015
- Negotiated terms with school principal to run program 3 times a week during the school day and help students at risk of failing to pass core, academic classes required to earn a high school diploma.
- Oversaw development of "life skills" in 25 mentor-mentee pairs to support classroom achievement.

Information Visualization Massively Open Online Course   Bloomington IN
Student Liaison   Spring 2014, Spring 2015
- Facilitated online discussion of nearly 2,000 enrolled students from over 50 different countries to augment the material taught during lectures.
- Reviewed student-facing materials such as examinations to ensure that online coursework maintained the high quality of an in-person university class.