SCOTT EMMONS

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EDUCATION
University of North Carolina at Chapel Hill
Bachelor of Science, *Mathematics and Computer Science*, GPA 4.0/4.0   Expected May 2019

RESEARCH INTERESTS
Robotics * motion planning * network analysis * complex systems * community detection * algorithms * information theory * visual analytics * information visualization * online learning dynamics * scientometrics

RESEARCH EXPERIENCE
Intelligent Motion Laboratory, *Duke University*   Durham, NC
Undergraduate Researcher   August 2016 - Present
- 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

Cyberinfrastructure for Network Science Center, *Indiana University*   Bloomington, IN
Research Intern   September 2013 - Present
- 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
- Wrote up published results of experiments to communicate key findings to the scientific community
- Optimized computational experiments on supercomputer via parallel programming for 100x speed increase
- Led independent research project to map consumer purchasing behavior
- Developed interactive visualizations for users explore data and make new discoveries
- 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
- Created geospatial map to showcase the research center's worlwide impact

Carolina Center for Applied Mathematics, *Mucha Group, UNC*   Chapel Hill, NC
Undergraduate Researcher   November 2015 - Present
- Developed post-processing methods for community detection in networks to gain insight from large, complex network datasets
- Presented research ideas to foster group collaboration
- Studied graduate-level network science coursework in reading group to build the group's collective, foundational knowledge

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
Robertson Community Coordinators, *Robertson Scholars Leadership Program*   Chapel Hill, NC
Service Committee Member   August 2015 - May 2016
- Organized volunteer opportunities that drove civic engagement amongst Robertson Scholars
- Oversaw logistics and funding for 2 community service projects that improved living conditions in Durham and Chapel Hill

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
Sunflower County Freedom Project   Sunflower, MS
Teaching Assistant   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

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

PUBLICATIONS AND PRESENTATIONS
Publications
- **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), Forthcoming.*
- **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.

AWARDS AND HONORS
Academic
- Robertson Scholars Leadership Program, highly selective undergraduate merit scholarship providing unique "dual citizenship" at UNC and Duke University, leadership development workshops, and funding for three summers, 2015-2019, $250,000
- National Merit Scholar, chosen among top 0.6% of PSAT test takers, 2015, $2,500
- Honors Carolina, selected as top 10% of incoming UNC class, 2015-2019
- Honorable Mention Paper, M^3 Math Modelling Challenge of the Society for Industrial and Applied Mathematics, among top 6% of submitted papers, 2015

Competition
- 4th in nation and 2x state champion in case competition, Business Professionals of America, 2013-2014
- 10th in nation, computer programming concepts, Business Professionals of America, 2013
- 2x state champion, financial math and analysis, Business Professionals of America, 2013-2014