

SUMMARY

Driven to inspire students to pursue academic and personal excellence by teaching and demonstrating how data science can be applied to their own interests. Strives to foster creative and challenging learning environments in which students can find the joy and beauty of data and become life-long data scientists. Skilled in creating learning experiences and teaching data science courses. Experience using state-of-the-art data science techniques at a leading national laboratory. Published several papers on validating instruments to collect data on human attitudes and performance in computing, course interventions, and predicting student performance. Actively researches Augmented Reality, Computer Vision, and Data Science topics to help build a Data Science Augmented Reality Sandbox.

EDUCATION

University of Nebraska - Lincoln Ph.D. Computer Science, Advisor: Dr. Stephen Cooper, GPA: 3.8/4.0	Lincoln, NE 2017–2022
Montana State University B.S. Computer Science, GPA: 3.1/4.0	Bozeman, MT 2013–2017

TEACHING

- **Instructor** at Jeffrey S. Raikes School of Computer Science and Management Current
 - Stats and Applications: (RAIK 270H)
 - Data and Models II: (RAIK 370H)
 - Data and Models III: (RAIK 371H)
- **Instructor** at University of Nebraska - Lincoln Fall 2020 and Fall 2021
 - CS I: Data Science Focused (CSCE 155:T)
- **Instructor** at Technische Universität Wien - Vienna, Austria Summer 2017
 - Python! (CSCI 490)
- **Instructor** at Bozeman High School Spring 2016
 - Joy and Beauty of Data (CSCI 108)

EXPERIENCE

Jeffrey S. Raikes School of Computer Science and Management Postdoc - Data Science	Lincoln, NE 2022 - Current
<ul style="list-style-type: none">– Designed and built a Data Science Augmented Reality Sandbox.– Used the Sandbox to teach hands on data science topics to computing students– Used the Sandbox to teach topographic and geological maps to geology students– Taught several courses that focus on data science, stats, and machine learning.– Worked with the Design Studio teams to mentor students in AI and Machine Learning projects.	
University of Nebraska - Lincoln Instructor	Lincoln, NE 2020 - 2022
<ul style="list-style-type: none">– Taught an introductory computing course that was focused on informatics and data science to non-CS majors.	

- Bridged the gap between data science and students' domain knowledge.
- Achieved the highest retention rate (above 90%) out of any introductory computing course at UNL.
- Created labs and homework assignments to foster students' creativity.
- Mentored students in Machine Learning projects.

University of Nebraska - Lincoln

Lincoln, NE

Graduate Research Assistant

2017 - 2022

- Designed and validated a multi-language introductory computing programming assessment, involving 1600 students across 3 universities. (see Publications)
- Designed and validated a computing attitude survey. (see Publications)
- Designed course material to be used as interventions across 3 universities.
- Supervised data collection starting in Spring 2017 continuing until 2022. (see Publications)
- Created a cognitive way-finding instrument.
- Re-designed a topographic map assessment.

Lawrence Livermore National Laboratory

Livermore, CA

Graduate Data Scientist Intern

Summer 2018, Summer 2019

- Analyzed site wide/HPC power usage to predict power fluctuations and anomaly detection.
- Used Machine Learning algorithms such as Neural Nets, Random Forest and Gaussian Naive Bayes to predict power fluctuations and anomaly detection.
- Used traditional mathematical approaches such as Autocorrelation and Fourier Transform to predict fluctuations and anomaly detection.
- Ran image processing with Machine Learning algorithms to categorize images at real time with 98.9% accuracy.
- Worked with the Energy Efficient HPC Working Group
- Worked with global HPCs facilities to determine best energy efficiency practices.
- Sites included; Lawrence Livermore National Laboratory, Lawrence Berkeley National Laboratory, Oak Ridge National Laboratory, CINECA, RIKEN, and LRZ.
- Chair of the Energy Efficient High Performance Computing State of the Practice Workshop, 2019.

Montana State University

Bozeman, MT

Teaching Instructor

2016 - 2017

- Created and piloted an introductory data science course which now serves as the introductory CS course at Montana State University: CSCI 108 - Joy and Beauty of Data
- Assisted in other courses including : CSCI 111 - Programming with C and CSCI 591 - Computer Science in the Classroom.

PUBLICATIONS

- [1] **R. Bockmon** and S. Cooper, “The dangers of participation bias”, Communications of the ACM, 2022.
- [2] **R. Bockmon**, S. Cooper, J. Zhange, S. Sorby, and M. Dorodchi, “A hybrid approach to administering a spatial skills intervention”, submitted for publication, 2022.
- [3] B. Gopal, S. Cooper, and **R. Bockmon**, “Industry partners’ reflections on undergraduate software engineering students: An exploratory pilot qualitative study”, 32st Annual Workshop of the Psychology of Programming Interest Group (PPIG 2021), 2021.
- [4] B. Gopal, S. Cooper, J. Olmanson, and **R. Bockmon**, “Difficulties in unit and integration testing: A qualitative study”, 32st Annual Workshop of the Psychology of Programming Interest Group (PPIG 2021), 2021.

- [5] J. Parkinson, Q. Cutts, M. Liut, A. Petersen, S. Sorby, and **R. Bockmon**, “Practice report: Six studies of spatial skills training in introductory computer science”, ACM Inroads, 2021.
- [6] **R. Bockmon**, S. Cooper, J. Gratch, and M. Dorodchi, “Validating a cs attitudes instrument”, ser. SIGCSE ’20, Portland, OR, USA: Association for Computing Machinery, 2020, pp. 899–904.
- [7] **R. Bockmon**, S. Cooper, J. Gratch, J. Zhang, and M. Dorodchi, “Can students’ spatial skills predict their programming abilities?”, in *Proceedings of the 2020 ACM Conference on Innovation and Technology in Computer Science Education*, ser. ITiCSE ’20, Trondheim, Norway: Association for Computing Machinery, 2020, pp. 446–451.
- [8] **R. Bockmon**, S. Cooper, W. Koperski, J. Gratch, S. Sorby, and M. Dorodchi, “A cs1 spatial skills intervention and the impact on introductory programming abilities”, ser. SIGCSE ’20, Portland, OR, USA: Association for Computing Machinery, 2020, pp. 766–772.
- [9] Y. He, **R. Bockmon**, M. Modey, and S. Roscoe, “Classification of cancer types based on gene expression data”, in *2020 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, IEEE, 2020, pp. 2175–2182.
- [10] **R. Bockmon**, S. Cooper, J. Gratch, and M. Dorodchi, “(re)validating cognitive introductory computing instruments”, in *Proceedings of the 50th ACM Technical Symposium on Computer Science Education*, ser. SIGCSE ’19, Minneapolis, MN, USA: Association for Computing Machinery, 2019, pp. 552–557.

INVITED TALKS

- [1] **R. Bockmon**, “Spatial Skills and Computing”, Discipline-Based Education Research Group (DBER) at University of Nebraska - Lincoln, 2021.

POSTERS

- [1] **R. Bockmon** and G. Abdulla, “Predicting Site Wide Power Fluctuations: Over +/- 750Kw” at Lawrence Livermore National Laboratory Data Science Institute Workshop, 2018.

SKILLS

- **Instrument Validations:** Exploratory/Confirmatory Factor Analysis, PCA, Item response theory
- **Data Analysis:** Linear Regressions, non-parametric statistics, multivariate statistics, data mining, data visualization, etc.
- **Machine Learning:** Random Forests, SVMs, Neural Nets, Naive Bayes, etc.
- **Python Libraries:** Pandas, Numpy, Matplotlib, SciKitLearn, TensorFlow and Gempy

PROGRAMMING LANGUAGES

- **Python:** High proficiency
- **R:** Medium proficiency
- **Java:** Medium proficiency
- **C++:** Medium proficiency
- **C:** Low proficiency

PROJECTS

Augmented Reality Sandbox

Currently working on creating an augmented reality sandbox in conjunction with the Geology Department at University of Nebraska-Lincoln. This project is meant to be used as a teaching tool to teach way-finding and spatial skills. This AR sandbox is to be used as a tool to teach structural geology. The primary goal for the future of this project is to implement the sandbox to be taught to K-12 students. It will be use to simulate water to teach many concepts such as the water cycle, pollution runoff, and ground water/rain interaction.

Click2CS

Currently working on a project with 4-H called Click2CS. Click2CS will be a website to host material for teachers, students, and mentors to help get computing into the 4-H program. It is currently in early stage of development with collaborations across several universities and Google.

EXTRACURRICULAR ACTIVITIES

- CSE Graduate Student Representative - Curriculum 2020–2021
- CSE Graduate Student Association - Treasurer 2019–2020