MAX SPRINGER
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EDUCATION

University of Maryland College Park, MD
Ph.D., Applied Mathematics (Dean's Fellowship) August 2020 - Present
- Selected Coursework: Abstract Algebra, Partial Differential Equations, Numerical Methods for Evolution of PDEs

Cornell University Ithaca, NY
B.A., Magna Cum Laude, Mathematics - minors in Cognitive and Biological Sciences May 2019
- Selected Coursework: Object Oriented Programming and Data Structures, Nonlinear Dynamics and Chaos, Probability and Inference Modeling, Applied Complex Analysis, Stochastic Processes, Modeling Behavioral Evolution

RESEARCH EXPERIENCE

Blumenfeld Lab | *Yale University – School of Medicine* New Haven, CT
Postgraduate Research Fellow June 2019 – July 2020
- Processed and analyzed clinical EEG and fMRI signals to elucidate characteristics associated with epileptic activity.
- Wrote custom MATLAB and Python scripts to perform spectral and time-frequency analysis to classify scalp EEG activity.
- Developed a machine learning classification algorithm to predict lapses in consciousness due to epileptiform discharges.

Laboratory of Cell Biology (Integrative Cancer Dynamics) | *National Cancer Institute* Ithaca, NY
Research Intern January 2018 – June 2019
- Built a high-dimensional nonlinear dynamical system to model the dynamics of cell growth and death via bifurcations.
- Investigated methodologies to reduce the dimension of dynamical systems while maintaining certain key aspects of the dynamics.
- Researched bifurcation signatures from sparsely sampled single-cell RNA sequencing data in a way that emulates the methods of nonlinear dynamics with implications on tumor predictability.

Computational Physiology Laboratory | *Cornell University* Ithaca, NY
Research Assistant January 2017 – January 2018
- Investigated the physiological effects and behavioral role(s) of serotonin within the rodent olfactory bulb.
- Analyzed EEG signals after collection in the form of neural time series using MATLAB and Python.
- Modeled the rodent olfactory bulb in Python to further examine the capabilities of certain regions on rodent behavior.

Dr. Maitre Research Lab | *Nationwide Children's Hospital (NICU)* Columbus, OH
Research Intern May 2016 – August 2016
- Recorded high-density 128-channel EEG and event-related potentials (ERPs) to calibrate touch procedures on premature babies.
- Analyzed ERPs with Cartool freeware by comparing voltages as a function of time across an entire electrode montage.

PUBLICATIONS

Li, R., Ryu, J., Vincent, R., **Springer, M**, … Blumenfeld, H. (2020) Subcortical Arousal Systems in Transient and Sustained Changes in Attention: A Pulse-Step Model. *NeuroImage* (in review: *NeuroImage*)

Springer, M. et al. (2020) A Machine Learning Approach for Classification of Spike-Wave Discharges in Absence Epilepsy (in review: *Neurology*).

Ryu, J., Chen, A., **Springer, M**., … Blumenfeld, H. Differing Roles of Cortex and Thalamus in Timing of Functional Activity Changes with Absence Seizures. (in preparation).

CONFERENCE PRESENTATIONS

Springer, M. et al. (2020, December). A Machine Learning Approach for Classification of Spike-Wave Discharges in Absence Epilepsy. Poster session to be presented at the annual American Epilepsy Society (AES) meeting. Seattle, WA.

Cohen, E., **Springer, M**., … Blumenfeld, H. (2019, December). Driving Safety in Patients with Generalized SWD but no Clinical Seizures: Evaluation with a Realistic Driving Simulator. Poster session presented at the annual American Epilepsy Society (AES) meeting. Baltimore, MD.

LEADERSHIP AND ACTIVITIES

Physics Department | *Cornell University* Ithaca, NY
Master Undergraduate Teaching Assistant August 2016 – May 2019
- Taught undergraduate students in introductory mechanics, electricity and magnetism concepts in small group discussions.
- Mentored new undergraduate teaching assistants in effective science communication and learning discrepancies.
- Attended seminars on how to better communicate difficult concepts and lead students to better understandings of concepts.

PREVIOUS OCCUPATIONS

Cornell Adult University Ithaca, NY
Quantum Physics Course Head June 2017 – August 2017
- Taught students between the 8th and 10th grades the central concepts of quantum mechanics in a week-long crash course.
- Designed the daily lesson plan and laboratory experiments for each one week session.

ADDITIONAL SKILLS: Java, MATLAB, Python, R, Adobe Illustrator, Excel, Photoshop, German (limited), Italian (limited)