



Aaron Kelley

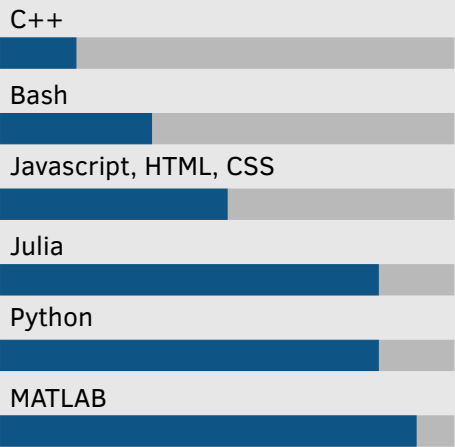
Master's Student

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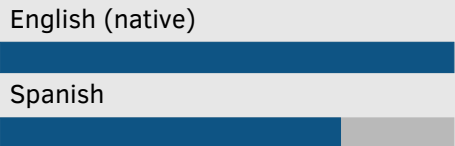
About me

Aaron is in his third semester of a Master's degree in mathematics at the National Autonomous University of Mexico (UNAM). His Master's project concerns a structural analysis of multispecies ecosystems via topological tools.

Programming



Languages



(*)[The skill scale is from 0 (Fundamental Awareness) to 6 (Expert).]

Interests

Math, Neuroscience, Programming

Education

- 2020-now M.S. in Mathematics Universidad Nacional Autónoma de México
Thesis: *Describing the topological collapse of mutualistic ecological systems via coexistence holes*
- 2014-2019 B.S. Biochemistry and Mathematics University of Michigan
Thesis: *Crystal structure of a periplasmic activator of peptidoglycan synthesis E. coli LpoA N-terminal domain and comparison with H. influenzae crystal structure and E. coli NMR Structure*

Awards

- 2018 Making a Difference Award/Issued by U of M Department of Volunteering for always going above and beyond for Hospital Elder Life Program (HELP) patients
- 2017 UM Club Ann Arbor/Recognition for Academic and Community involvement

Experience

- 2020-2021 Neurobiology Institute, UNAM Research Fellow
Worked on two main projects under the supervision of Dr. Hugo Merchant Nancy. The first project involved the standardization of the spike sorting algorithm used in the lab(Kilosort2). The second was the analysis of neurophysiological data from two Rhesus monkeys who performed a series of tapping-continuation tasks under skewed distributions. The goal is to further examine the neurological underpinnings of bias in the brain, and how this is represented and developed on the level of single neurons and ensembles
- 2019 NeuroNexus Inc. Internship
My role was as a software engineer on the Sapiens software platform used in the SmartboxPro. The work focused on both front (ReactJS) and backend (Python and C++) programming, controlling data acquisition, and the processing of neural signals.
- 2018 University of Michigan NSF-IPAN Internship
Analyze optophysiological data from 8 rats who were optogenetically stimulated for multiple trials. This included using Matlab to load the data perform analyses as well as model both channelrhodopsin-1 and sodium channel kinetics. Additionally, I organized the data into a large database (via Matlab) for easy access in the future.

Publications

- [1] Marco Tulio Angulo et al. "Coexistence holes characterize the assembly and disassembly of multispecies systems". In: *Nature Ecology & Evolution* (May 2021).
- [2] Aaron Kelley, J. Vijayalakshmi, and Mark A. Saper. "Crystal structures of the amino-terminal domain of LpoA from *Escherichia coli* and *Haemophilus influenzae*". In: *Acta Crystallographica Section F* 75.5 (May 2019), pp. 368–376.
- [3] Jung-Ho Shin et al. "Structural basis of peptidoglycan endopeptidase regulation". In: *Proceedings of the National Academy of Sciences* 117.21 (2020), pp. 11692–11702.