Jake Sauter | Curriculum Vitae

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Senior Applied Mathematician and Computer Scientist attending SUNY Oswego. Passionate about research, with strong drive to enter Computational Biology fields.

Relevant Experience

- **iD Tech Camps** — **Vassar College/American University**
  Technical Coordinator/Instructor — *June 2016–August 2016*

  As a technical coordinator I was responsible for the technological well being of the camp and my duty was to make sure that camp ran smoothly. At Vassar College some weeks occupancy exceeded 80 students and at American University, being one of the largest camps in the US, there were 114 students. As an instructor I was responsible for 4-8 students over the course of a week with ages ranging from 7-17 depending on the class. Working with up to 15 other instructors and under the advisement of a director and assistant director for 7 weeks, I learned strong team working skills and communication in these positions. At the end of my work with the company my colleagues praised my work ethic.

- **NSF MedIX REU** — **Depaul University/University of Chicago**
  Undergraduate Researcher — *June 2017–August 2017*

  Completed a 10 week program as a member of a two person research team under advisement of Dr. Jacob Furst and Dr. Daniela Stan Raicu. During the first few weeks the goal was to get comfortable in the field and current work, and this was facilitated by reading many scientific publications, allowing for the development of skills involved with scientific reading. The next phase consisted of model forming, followed by implementation and experimentation with the statistical model. This cycle of model formation and experimentation was repeated until enough data was obtained for the solidification of a scientific paper detailing our process and results. After a successful submission to the SPIE Houston 2018 conference, the paper was accepted for poster presentation, with the manuscript to be published in the conference proceedings later in 2018. Work was done in Python and is available for viewing on Github

- **Computational Neuroscience Student Researcher** — **Carnegie Mellon University/University of Pittsburgh**
  Undergraduate Researcher — *June 2018–August 2018*

  Completed a 2 week Computational Neuroscience "bootcamp" filled with lectures from many leading researchers in the field. Following the lecture period, 8 weeks of research were completed under advisement from professor Coutanche (Univ. of Pitt.) in the Learning in Neural Systems Lab. Work was done in MATLAB and is available for viewing on Github

Education

Academic Qualifications

- **SUNY Oswego** — **Oswego**
  GPA: 3.5, Computer Science, Mathematics, Physics, Cognitive Science — *2016–2019*
- **SUNY Fredonia** — **Fredonia**
  GPA: 3.91, Computer Science, Mathematics, Web Development — *2015–2016*
- **Arlington High School** — **Arlington**
  GPA: $\frac{97}{100}$, 6 APs, 1 college course, Advanced Regents Diploma — *2011–2015*

Research Publications

- **An Evaluation of Consensus Techniques for Diagnostic Interpretation** : published in SPIE Houston 2018 Conference Proceedings on work done at Depaul University during an NSF REU that took place the summer of 2017.

Coursework Website

- **www.cs.oswego.edu/~jsauter** *: Coursework for CSC 322, CSC416, CSC466, and COG376 available for viewing as well as chronological list of academic accomplishments and awards.*

Notable Projects

- **Lateralization of Brain Function**

  During summer 2018 undergraduate research opportunity under the advisement of Dr. Marc Coutanche.
  The purpose of this project is to locate functionally correlating regions of interest (ROIs) (e.g. correlating a brain region in the left hemisphere that responds to faces to a similar region in the right hemisphere that responds similarly). Once these regions are located, respresentation analysis can be performed through Multi-Voxel Pattern Analysis to test for the similarity of representations. Mult-Voxel representations (fMRI) of ROIs are used as features describing the stimuli that subjects are viewing. These features are used to train a machine learning classifier on the reserved test set of fMRI voxel recodings, generating a testing accuracy score. We are interested in if when we combine the corresponding ROI data, we see higher classification results than for either single hemispheric ROI. This would indicate that the representations are both different and informative, and what results indicate might be the case.

- **Artificial Neural Network For The Assessment Of Probability Of Winning From A Game State In Dobo**

  My independent research project for CSC466: Artificial Intelligence and Heuristics centered around a game called DOBO. First I automated a process to decompose each game, being a sequence of game states, and to properly adjust the probability of winning from that game state. With this tool I could simulate many games and learn more about tactic from each recorded game. After I had composed a database of probabilities associated with each state, I constructed an ANN from scratch in Common LISP with inputs being the game state (each node representing a board section) and outputs being a floating point number between 0 and 1, representing the probability of winning from that game state. When a program played with the assistance of this neural net, it would posses a very useful heuristic for winning in a light package. Please see personal website for more details.

- **Simulated Cache, Bomb Lab and Tiny Shell**

  This series of projects completed during the course of CSC322: Systems Programming in SUNY Oswego consisted of fundamental knowledge detailing the inner workings of UNIX operating systems. I learned how a cache works through simulating data retrieval, as well as engineering many possible configurations of settings that adhered to different standards used. I learned assembly from the very popular bomb lab, in which one must decode C code from the compiled assembly. I have kept track of system jobs and managed command executions by completing a full fledged shell. I can say with certainty that this experience made me a better programmer.

Technical and Personal Skills

- **Programming Languages:** Become mainly interested in the use of Python, currently using R and Bioconductor for cancer genomics classification. More than 5 years of programming experience have lead to familiarity with: C, C++, Python, and Java. Also basic ability with: git, Matlab, Assembly, TeX, Javascript, HTML, CSS, PHP, MySQL. Exposure to many languages and repeating the process of learning a language have made it routine to attain proficiency in any language of choosing.
- **Linux:** Operated with Linux as primary operating system for close to 4 years now as well as have taken a class introducing super users and programmers to the tools available through the use of Linux. Command line tools allow for more flexibility in commands and opens up a whole new world to the solutions of interesting problems.
- **Research and Independence:** Accumulated research experience in which I was quite independent and self-directed the research to successful results.
- **Team Skills:** Work well in a team. Good presentation skills.
- **Organization:** Emphatic about organization and soundness of project structure. Can write well organized and structured reports.

Interests and Extra-Curricular Activities

- Competitive programming: Freshman year at SUNY Fredonia and Sophomore year at SUNY Oswego in ACM and CCSCNE
- Presented for the SUNY Oswego CS club for Machine learning and Artificial Intelligence
- Outdoor activities such as biking and kayaking i
- Competed in Track and Field all four years of high school, and underwent ACL recovery for duration of 8 month season Freshman year at SUNY Fredonia