JONATHAN A. CHEUNG

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Summary

- **6 years of experience using machine learning tools for data-driven scientific discovery**
- **4 publications demonstrating highly productive, detail-oriented, and solution-focused nature**
- **2 contracts leveraging data to deliver business solutions**

Experience

Doctoral Researcher – Hires Laboratory, University of Southern California Sept. 2014 – Apr. 2020

- Established protocols to answer the question of "How does the brain represent touch?" by crafting data pipelines to collect, synchronize, and package 30 million timepoints of sensor motion and neural recordings
- Generated more accurate behavioral and neural models through creative feature engineering via applying domain expertise, time-series filtering and physics models
- Resolved a decade-long debate regarding touch search strategies using predictive behavioral modeling on 16 uniquely extracted touch features
- Discovered a neural representation of touch location and hypothesized a circuit model for this sensorimotor transformation using interpretable machine learning models such as generalized linear models
- Produced key findings for 2 major grants, increasing funding from $1M to $4.5M over 4 years, by collaborating with colleagues to author 4 manuscripts in high-impact peer reviewed journals
- Promoted a legacy of collaboration by recruiting, mentoring, and training new hires in the scientific method

Data Science Contractor Aug. 2019 – Present

- Sene Studio
  - Ensured data quality and improved accessibility to data by replacing disorganized spreadsheets with an automated extract, transform, load (ETL) workflow with data warehousing in AWS S3 and postgreSQL
  - Reduced order returns and costs by 38% ($58k), leading to a 30% increase in positive customer review, using a boosted regression model to optimize fit for made-to-measure suits and jeans
- Structure Research
  - Standardized metrics, improved data quality, and saved days of manual calculations for a premier data center research group by building an automated analyses pipeline in Python
  - Improved customer experience and web traffic by 20% through application of an interactive data visualization monthly newsletter

Skills

- Tools: Python | Matlab | SQL | Spark | AWS S3
- Python libraries: pandas | NumPy | scikit-learn | SciPy | TensorFlow | PyTorch | PySpark | matplotlib | plotly
- Statistical learning tools: generalized linear models (GLM) | gradient boosted machines (GBM) | linear and logistic regression | XGboost | clustering | time-series forecasting | dimensionality reduction | SVM | CNN | NLP

Publications, Awards, and Achievements

Kim J, **Cheung JA,** Hires SA (2020) – Behavioral and neural bases of tactile shape discrimination learning in head-fixed mice (*in review*)

Cheung JA, Maire P, Kim J, Lee K, Flynn G, Hires SA (2020) – Active touch remaps barrel cortex output from a representation of self-motion to object location. *(in review)*

Cheung JA, Maire P, Kim J, Sy J, Hires SA (2019) – The behavioral basis of whisker-guided anteroposterior object localization in head-fixed mice. *(Current Biology)*

First Place Presentation in Systems Neuroscience 2018 (*USC Annual Research Symposium*)

Cheung JA, Hsu T, Liang J, Kanoski S (2015) The role of central melanin concentrating hormone signaling in the higher-order control of food intake – Annual DORI Symposium 2nd Place Award, invited talk.

Stokes JA, **Cheung JA,** Eddinger KA, Corr M, Yaksh TL (2013) - Toll-like receptor signaling adapter proteins govern spread of neuropathic pain and recovery post nerve injury in male mice. (*Accepted - J Neuroinflammation)*

National Institute of Health Intramural Research Training Award 2013-2014 (*National Institute on Aging)*

Service and Broader Impacts

Mentor - USC Neuroscience Graduate Forum Aug. 2015 – Apr. 2020

- Increased assimilation for new students into the neuroscience program, as measured by successful placement of 4 students into laboratories within 6 months of program start, through monthly meets and weekly check-ups

Social Chair - USC Neuroscience Graduate Forum Aug. 2015 – Aug. 2016

- Promoted interdisciplinary collaborations by fostering community across graduate disciplines by working with administration to negotiate funding and organize monthly events and celebrations

Educator – California Science Center Nov. 2014 – July 2016

- Increased exposure of neuroscience to the general public, as measured by a 67% increase in attendance (from an average of 70 to 115 visitors per hour), through the development of new interactive presentations

Biological Sciences Senator – University of California, San Diego June 2012 – June 2013

- Expanded visibility of student research to the San Diego public by collating student research and restarting the Saltman Quarterly, UCSD's primary publisher of undergraduate findings
- Improved placement of biological sciences students into full-time careers, tracked by a 6% increase (+152 students) from previous years, through collaboration with Dr. Gabriele Wienhausen, Faculty Director of Education, to develop mentorship programs and science career fairs

College Council President – University of California, San Diego June 2011 – June 2012

- Successfully negotiated a decrease in fee-hike and increased opening hours of UCSD libraries by holding public meetings, collecting opinions of students I was elected to represent, and negotiating with administration

Education

Ph.D. Neuroscience
University of Southern California
Los Angeles, CA / 2020

B.S. Human Biology
University of California, San Diego
San Diego, CA / 2013