NICHOLAS ROBERTS

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EDUCATION

University of California San Diego, La Jolla, CA September 2015 - Present
BS Computer Science, Mathematics minor, **Expected graduation:** March 2019 **Major GPA:** 3.9
Fresno City College, Fresno, CA August 2013 - May 2015
Computer Science (Leon S. Peters Honors Program) **Major GPA:** 4.0

PUBLICATIONS

Roberts N., Purushothama P. S., Vasudevan V. T., Ravichandran S., Zhang C., Gerwick W. H., Cottrell G. W. (2019). Using Deep Siamese Neural Networks to Speed up Natural Products Research. *(Under Review) International Conference on Learning Representations, 7.*

Dasgupta S., Dey A., Roberts N., Sabato S. (2018). Learning from discriminative feature feedback. *Neural Information Processing Systems, 31.*

Zhang C., Idelbayev Y., Roberts N., Tao Y., Nannapaneni Y., Duggan B. M., Min J., Lin E. C., Gerwick E. C., Cottrell G. W., & Gerwick W. H. (2017). Small Molecule Accurate Recognition Technology (SMART) to Enhance Natural Products Research. *Scientific Reports, 7.*

RESEARCH

Kumaraswamy-Beta Variational Autoencoder with Professor David Meyer (UCSD)

· Developed a novel probabilistic approach to learning disentangled Boolean attributes of image data
· Evaluated the performance of learning disentangled Boolean attributes of the CelebA dataset
· Developed a methodology for extracting discrete Boolean attributes from continuous parameters of the latent space

Learning From Discriminative Feature Feedback with Professor Sanjoy Dasgupta (UCSD)

· Implemented a novel algorithm proposed by Sanjoy Dasgupta for learning a subclass of DNF boolean formulas
· Designed new datasets and interactive learning experiments to validate theoretical findings
· Investigated feature extraction algorithms to preprocess image data for use with the DFF algorithm

Soft Purity with Professor Gary Cottrell (UCSD)

· Developed a novel loss function for clustering based on the purity measure
· Proved that the loss function approximately optimizes the purity measure, which cannot be directly used as a loss
· Experimentally validated the loss used in a convolutional neural network trained on images of handwritten digits
· Evaluated the usefulness of the loss function as a regularizer for siamese neural networks

Small Molecule Accurate Recognition Technology with Professor Gary Cottrell (UCSD)

· Proposed the use of the purity measure as an evaluation criterion of resulting cluster maps of natural products
· Analyzed performance of deep learning system for use in natural products research and improved the model
· Evaluated the effect of adding artificial experimental noise to data
· Best Spotlight Presentation at *Applied Machine Learning Days 2018* at EPFL in Lausanne, Switzerland

EXPERIENCE

Intuit June 2019 - August 2019
Software Engineering Intern - Intuit Futures research group (upcoming)

UnifyID March 2019 - June 2019
AI Fellow/Machine Learning Research Intern (upcoming)

Intuit June 2018 - September 2018
Software Engineering Intern - Intuit Futures research group

- Technologies used: Python, PyTorch, TensorFlow, Gensim, Keras, Jupyter Notebook, Matplotlib
- Researched and implemented a novel deep learning model for controllable text generation as a service within Intuit
- Developed a system for proposing alternative candidate sentences for Intuit content writers using deep learning
- Investigated the use of dynamic topic models for customer support tickets to gain actionable insights over time

Altum January 2018 - May 2018
Financial Machine Learning Researcher

- Technologies used: Python, PyTorch, Jupyter Notebook, Matplotlib
- Developed language model to extract NLP features from text data regarding cryptocurrency trading
- Investigated unsupervised learning techniques for extracting sentiment data in real time from online forums

UCSD CSE Department September 2017 - March 2018
DSC 10/20 Tutor

- Technologies used: Python, Jupyter Notebook, Matplotlib, Numpy
- Tutored DSC 10 Introduction to Data Science, under Professor Janine Tiefenbruck
- Tutored DSC 20 Principles of Data Science, under Professor Marina Langlois
- Helped beginner programmers learn to code in Python and use code to perform statistical analyses
- Helped beginner programmers understand and use data structures to solve data science related problems

Teradata June 2017 - September 2017
Software Engineering Intern

- Technologies used: Scala, SBT, Java, Maven, Teradata SQL, AWS, Python, TensorFlow, Flask
- Developed open source Spark-Teradata connector forked from Databricks connector for AWS Redshift in Scala
- Designed and implemented Teradata stored procedures in Java to mimic Redshift's UNLOAD/COPY using S3
- Improved training methodology and architecture of deep learning time series model used internally

Skqrl June 2016 - December 2016
Software Engineering Intern

- Technologies used: Scrapy, Selenium, Python, Django, MySQL, Bootstrap, JavaScript
- Developed web crawler to compile needfinding and product data using Scrapy and Selenium
- Designed and implemented object oriented search solution using Python/Django/MySQL

ModSpot January 2016 - March 2016
Software Engineering Intern

- Technologies used: Objective-C, iOS, SQLite
- Implemented new user account, edit profile, and login designs in Objective-C for iOS application
- Refactored analytics code for gathering statistics on app usage, helping designers make more informed choices

The Comeback Community June 2015 - September 2015
Volunteer Full Stack Developer

- Technologies used: Go, gohtml templates, JavaScript, CSS, Google Cloud Platform
- Developed website for educational nonprofit in Go, gohtml, and CSS on Google Cloud Platform
- Mentored new volunteer developers in web development with an emphasis on writing maintainable code

Fresno City College January 2015 - May 2015
Tutor

- Technologies used: Matlab, Octave, C++, Java, Android, XML, MySQL
- Tutored Android application development in Java and helped beginner programmers learn to code
- Tutored mathematics including algebra, trigonometry, precalculus, calculus, and linear algebra
- Tutored introductory data structures and discrete mathematics in C++

AWARDS

Computing Research Association (CRA) 2019
Outstanding Undergraduate Researcher Award - honorable mention

Neural Information Processing Systems (NeurIPS) 2018
Travel Award

Applied Machine Learning Days (AMLD) 2018
Best Spotlight Presentation Award

EXTRACURRICULAR ACTIVITIES

UCSD:	Tau Beta Pi Engineering Honor Society	House Leader
	Triton Engineering Student Council	Data Analyst
	Data Science Student Society	Workshop Coordinator
FCC:	Google Developer Group Fresno City College	President
	Science and Engineering Club	Treasurer

TECHNOLOGIES AND SKILLS

Competent: Python, TensorFlow, Java, Scala, C/C++, PyTorch, Unix, AWS
Familiar: SQL, JavaScript, Node.js, OCaml, Maven, Gradle, Docker, Matlab/Octave