

JOHN KEVIN CAVA

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EDUCATION

Arizona State University, Tempe AZ
Ira Fulton Schools of Engineering:

GPA: 3.65/4.0
PhD, Computer Science
Expected: May 2025

Arizona State University, Tempe AZ
Ira Fulton Schools of Engineering:
College of Liberal Arts & Sciences:

Bachelors of Science, Computer Science
Bachelors of Science, Mathematics
Bachelors of Science, Molecular Biosciences & Biotechnology
August 2014 - May 2018

WORK EXPERIENCE

Graduate Research Intern

Lawrence Berkeley National Lab, Scientific Data Division, Machine Learning & Analytics

May 2023 - August 2023
Berkeley, CA

- Implemented visualization code from a state of the art machine learning paper of Neural Network Subspaces
- Created neural network training experiments to be used for loss landscape visualizations and high dimensional structure for scientific problems
- Designed and constructed a pipeline to create ML experiment results that could be run in the NERSC (National Energy Research Scientific Computing Center) cluster
- Presented iterative improvements of training experiments and visualization results weekly to group of Postdocs and Research Scientists

Data Anlyst Intern

American Express, ITSM Suite Development & Integration

June 2017 – August 2017
Deer Valley, AZ

- Designed, Implemented, and Documented ITSM API endpoints within Apigee for Internal American Express Customers (Departments)
- Tested API endpoints through SoapUI and Postman
- Developed basic MEAN and MERN stack applications and hosted them in American Express servers in order to provide business case of whether or not to use React or Angular for the team

Software Engineering Intern

American Express, Employee and Communications Technology

June 2016 – August 2016
Desert Ridge, AZ

- Designed and implemented a web application that retrieves relationships from a graph database (Neo4j) and visualizes said relationships within a graphical user interface (Javascript and AngularJS Framework)
- Implemented a Java program that imports American Express' data about its internal applications and technologies into a graph database.

RESEARCH EXPERIENCE

Graduate Research Assistant

Arizona State University, Biodesign Center for Applied Structural Biology, Advisor: Dr. Abhishek Singharoy *Tempe, AZ*

August 2021 - Present

- Design and construct deep learning models (e.g GANs) to generate new structures in molecular protein dynamics based on potential energy
- Use RL and reward engineering in order to train models that can generate physically relevant trajectories

Graduate Research Assistant

Arizona State University, PI: Dr. Lalitha Sankar

January 2020 - August 2021
Tempe, AZ

- Conduct deep learning experiments on state of the art robust loss functions and α -loss

Graduate Research Assistant

Arizona State University, Efficient Vehicles & Sustainable Transportation, PI: Dr. Hongbin Yu

August 2018 – Dec 2019
Tempe, AZ

- Collected and Aligned LiDAR (30 hours of pedestrian LiDAR Data) and Camera data (2.5 hours of aligned LiDAR and varying focal length camera data)
- Wrote a conference workshop paper and presented the paper as an oral talk in ICCV 2019
- Designed and developed deep learning models for distance estimation from camera data

SKILLS

Languages Python, Intermediate Javascript, Intermediate Java
Libraries pyTorch, pyTorch-geometric, numpy, matplotlib, TorchMD

PUBLICATIONS & PREPRINTS

- **Cava, John Kevin**, Ankita Shukla, John Wyatt Vant, Shubhra Kanti Karmaker, Pavan K. Turaga, Ross Maciejewski, and Abhishek Singharoy. "Latent Sequence Generation of Steered Molecular Dynamics." In ICLR 2023 Workshop on Physics for Machine Learning. 2023.
- Otstot, Kyle, **John Kevin Cava**, Tyler Sypherd, and Lalitha Sankar. "AugLoss: A Learning Methodology for Real-World Dataset Corruption." arXiv preprint arXiv:2206.02286 (2022).
- Ho, Nicholas, **John Kevin Cava**, John Vant, Ankita Shukla, Jake Miratsky, Pavan Turaga, Ross Maciejewski, and Abhishek Singharoy. "Learning Free Energy Pathways through Reinforcement Learning of Adaptive Steered Molecular Dynamics." bioRxiv (2022): 2022-10.
- **Cava, John Kevin**, John Vant, Nicholas Ho, Ankita Shukla, Pavan Turaga, Ross Maciejewski, and Abhishek Singharoy. "Towards Conditional Generation of Minimal Action Potential Pathways for Molecular Dynamics." arXiv preprint arXiv:2111.14053 (2021).
- Sypherd, Tyler, Mario Diaz, **John Kevin Cava**, Gautam Dasarathy, Peter Kairouz, and Lalitha Sankar. "A Tunable Loss Function for Robust Classification: Calibration, Landscape, and Generalization." arXiv preprint arXiv:1906.02314 (2020).
- Gupta, Chittrak, **John Kevin Cava**, Daipayan Sarkar, Eric A. Wilson, John Vant, Steven Murray, Abhishek Singharoy, and Shubhra Kanti Karmaker. "Mind reading of the proteins: Deep-learning to forecast molecular dynamics." bioRxiv (2020).
- **John Kevin Cava**, Todd Houghton, Hongbin Yu. Towards Generalizable Distance Estimation By Leveraging Graph Information. Proceedings of the IEEE International Conference on Computer Vision Workshops 2019.
- **John Kevin Cava**, Gaoyang Li, Wei Du, Huansheng Cao. WITOD: A Tool for Within-Taxon Operational Taxonomic Unit Diversity Analysis. bioRxiv, 813444

EXTRACURRICULAR ACTIVITIES

Venue Coordinator, SWHacks Fall 2016 - Spring 2017

- Planned and organized the venue operations for SWHacks - a hackathon - held at Arizona State University (Spring 2017)

Director of Operations, Software Developers Association (SoDA) Fall 2016 - Spring 2017

- Overseen all logistics and operations for SoDA (i.e, room reservations, food for events, or anything that the organization needs to operate)

Events Planning Committee Lead, Software Developers Association (SoDA) Fall 2016 - Spring 2017

- Manage and schedule meetings between other officers under the Events Planning Committee to schedule the organization's events for each semester

University Outreach Chair, Software Developers Association (SoDA) Fall 2015 - Spring 2016

- Managed communications between university professors and other student organizations with SoDA.

Marketing Chair, Software Developers Association (SoDA) Fall 2014 - Spring 2015

- Managed communications between the organization and the university administration to provide mass coverage of events being hosted by SoDA.
- Directly contributed to the growth of SoDA via marketing the twice-weekly events to the entire ASU CIDSE department.

TEACHING

FSE 100 - Introduction to Engineering August 2020 - December 2020

AWARDS

President's Award - New American University Fall 2014 - Spring 2018

REFERENCES

Dr. Abhishek Singharoy, Assistant Professor at ASU School of Molecular Sciences Email: asinghar@asu.edu
Dr. Ross Maciejewski, Professor at ASU School of Computing and Augmented Intelligence Email: rmacieje@asu.edu