jcava@asu.edu **John Kevin Lopez Cava** Website: johncava.github.io

Education

Arizona State University, Tempe AZ **GPA: 3.61**
Ira Fulton Schools of Engineering: *PhD, Computer Science*
Aug 2020 - Present

Arizona State University, Tempe AZ **GPA: 3.22**
Ira Fulton Schools of Engineering: *Bachelors of Science, Computer Science*
College of Liberal Arts and Sciences: *Bachelors of Science, Molecular Biosciences & Biotechnology*
Bachelors of Science, Mathematics
August 2014 - May 2018

Research Experience

Arizona State University, Tempe AZ **August 2021 - Present**
Graduate Research, Biodesign Center for Applied Structural Biology, Advisor: Ross Maciejewski & Abhishek Singharoy
- 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

Arizona State University, Tempe AZ **January 2020 - August 2021**
Graduate Research, Advisor: Lalitha Sankar
- Conduct deep learning experiments on state of the art robust loss functions and α-loss

Arizona State University, Tempe AZ **August 2018 – Dec 2019**
Graduate Research, Efficient Vehicles & Sustainable Transportation, Advisor: Hongbin YU
- Collected and Aligned LiDAR and Camera data
  - ~ 30 hours of pedestrian LiDAR Data
  - ~ 2.5 hours of aligned LiDAR and varying focal length camera data
- Designed and developed deep learning models for distance estimation from camera data

Arizona State University, Tempe AZ **August 2017 – May 2018**
Undergraduate Research Assistant/ Graduate Research, Biodesign , Advisor:: Huansheng Cao
- Handling with Terabytes of Microbe Data for Network Analysis
- Created a python/bash pipeline to analyze data within ASU Research Computing Cluster

Work Experience

American Express, Deer Valley AZ **June 2017 – August 2017**
Analyst Intern, ITSM Suite Development & Integration
- 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

American Express, Desert Ridge AZ **June 2016 – August 2016**
Software Engineer III Intern, Employee and Communications Technology
- 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.

Skills

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

Publications and Preprints

- 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).
- **Cava, John Kevin**, John Vant, Nicholas Ho, Ankita Shulka, 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, Chitrak, **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*