Jonathan Valverde

Valverde.L.Jonathan@gmail.com
jonathan-valverde-l.github.io
linkedin.com/in/jonathanvalverde

EDUCATION

University of Maryland (UMD), College Park, MD 2022
M.S. in Computer Science

Princeton University, Princeton, NJ 2016
B.S.E. in Mechanical and Aerospace Engineering, magna cum laude
Certificates (Minors): *Applications of Computing, Robotics and Intelligent Systems*

PROFESSIONAL EXPERIENCE

Amazon, Seattle, WA (Remote) Summer 2020, Summer 2021
Applied Scientist Intern – Prime Video Recommendations

- Leveraged deep learning and recommendation algorithms in two research projects: ranking of content on the Prime Video homepage (2021) and modeling of item similarity with multi-modal data (2020). Outperformed baseline methods.
- Processed datasets on the order of 10,000 items and 1,000,000 impressions.
- Proposed, implemented, and tested alternate solutions to baseline algorithms by surveying literature and performing experiments using AWS platforms.
- Developed modular, re-usable codebases. Revised them through code reviews.
- Presented results in final papers and oral presentations.

Intelligent Automation Inc. (IAI), Rockville, MD 2017-2020
Research Engineer

- Contributed to research projects and proposals for government clients under the Small Business Innovation Research (SBIR) program.
- Conducted experiments, performed analyses, and developed code in support of multiple research projects involving machine learning, deep learning, and data analysis.
- Presented work to clients in written reports and periodic briefings.
- Projects included: a convolutional neural network for image recognition in non-visual spectrum, an automatic speech recognition module, and a machine learning classifier for detection of automated social media accounts.

CORE COMPETENCIES

Programming Languages: Python, Java, C, MATLAB
Python Libraries: PyTorch, Keras, TensorFlow, Scikit-learn, Pandas, NumPy

RESEARCH & PUBLICATIONS

Duncan C. McElfresh*, Sujay Khandagale*, **Jonathan Valverde***, John P. Dickerson, Colin White. On the Generalizability and Predictability of Recommender Systems. Submitted to *NeurIPS 2022*. Under review. Available upon request. (** Indicates equal contribution.*)

- Preliminary version accepted as "RecZilla: Algorithm Selection for Recommender Systems" at the *AutoML-Conf 2022* workshop. Available upon request.
- Addressing meta-learning problem of algorithm selection for collaborative filtering.

Master's Scholarly Paper: "Maximizing User Engagement in Social Network Advertising" (Available on Request) 2021

- Posed a multi-armed bandit problem on a graph structure to simulate the problem of choosing which advertisements to show to users on a social network, where some users are highly influential and must be prioritized, while others are followers.
- Designed and tested an algorithm to reduce regret on an influential node by gathering observations from its followers at the cost of using a biased estimator. Concluded that the algorithm outperformed existing unbiased baselines for a long initial horizon.

Senior Thesis: "Exploring Multi-Armed Bandit Decision-Making Strategies in an Underwater Vehicle Testbed" (Available on Request) 2015-2016

- Utilized multi-armed bandit algorithms to estimate the spatial distribution of a resource using an underwater robot.
- Explored the effects of variations in smoothness of the field and priors given to the algorithms using metrics such as distance traveled by the robot and expected cumulative regret.
- Discovered that slightly overestimating the field's smoothness resulted in shorter distances and reduced regret.

Jonathan Valverde, Nikhil Nigam, Ankit Tyagi, Junghsen Lieh, Matthew Nicholson, and Alireza Behbahani. Integrated Intelligent Control of Hybrid-Electric Unmanned Air Vehicles. In *AIAA Propulsion and Energy 2019 Forum*, Indianapolis, 2019. AIAA-2019-4349 (Restricted Access).

HONORS

GEM Fellowship, with sponsorship from Amazon and UMD 2020

- Stipend, full tuition, and fees provided for four semesters of MS program.
- One of two students selected by Amazon in 2020 for GEM sponsorship.

Magna cum laude (Princeton University) 2016

Induction into Sigma Xi: The Scientific Research Society (Princeton University) 2016

Sigma Xi Book Award for Outstanding Research (Awarded for Senior Thesis) 2016

Honorable Mention at the International Mathematical Olympiad (IMO) 2010

OTHER PROFESSIONAL EXPERIENCE

Princeton Department of Computer Science, Princeton, NJ 2015-2016
Introduction to Programming Systems Grader

- Graded and provided constructive feedback on students' weekly assignments.

The McGraw Center for Teaching and Learning, Princeton U., Princeton, NJ 2014-2015
Individual Tutor (Calculus and Linear Algebra)

Princeton Department of Mechanical and Aerospace Engineering, Princeton, NJ 2014
Summer Research Intern

- Assessed a novel technique for phase retrieval by conducting experiments on optical testbed.