NICO A. ESPINOSA DICE

nespinosadice@hmc.edu | 973.461.9402 | nico-espinosadice.xyz

EDUCATION

Harvey Mudd College, Claremont, CA (GPA: 3.83) Expected May 2022
B.S., Mathematics and Computer Science; Humanities Concentration in Philosophy

RELEVANT COURSEWORK

Spring 2022: Bayesian Statistics, NLP with Deep Learning, Mathematical Data Science + Topic Modeling, Quantum Information
Fall 2021: Geometry of Big Data, Natural Language Processing, Statistical Theory
Completed: Neural Networks, Artificial Intelligence, Algorithms, Mathematics of Big Data, Data Structures, Algebraic Geometry

SKILLS

Programming Languages: Python, C++, Java, C#, R, SQL, Scala
Models: Neural Networks (Transformers, RNNs, CNNs), Bayesian Networks, SVMs, Random Forest, Naive Bayes
Software: TensorFlow, PyTorch, Keras, Fastai, Scikit-learn, Pandas, NumPy, Matplotlib, Spark

RESEARCH EXPERIENCE

AMISTAD Lab, Harvey Mudd College – *Machine Learning Researcher, Team Lead* May 2020 - Present

- Derived theoretical generalization error bounds of learning algorithms in terms of algorithm capacity by introducing a novel geometric representation of algorithm bias.
- Developed a probabilistic model of abductive logical reasoning using a Bayesian network framework that constructs novel explanations of observed effects.

TECHNICAL EXPERIENCE

Etsy, **Inc**. – *Software Engineer Intern* May 2021 - August 2021

- Developed a transformer deep learning model with DistilBERT architecture using Tensorflow to identify safe search queries with over 91% accuracy.
- Improved query understanding at Etsy by retraining an existing transformer model that classifies search queries as broad or direct, increasing accuracy by 9% and reducing model volatility.

Viasat, **Inc**. – *Software Engineer Intern* May 2019 - August 2019

- Built REST API using CherryPy Python Library to enable communication between Microsoft HoloLens and Link 16 radio network.
- Developed a global runtime manager in C# to handle distribution of data into assets, allowing for live updating of heads-up display that improves situational awareness of soldiers.
- Presented by Viasat at *The Association of the United States Army Conference (AUSA 2019)* in October, 2019.

General Assembly: Data Science Course – *Student* June 2017 - August 2017

- Built a random forest regression model using Scikit-Learn and Python to predict the final sale prices of Iowa houses with 90% accuracy and completed General Assembly's Data Science course.

LEADERSHIP EXPERIENCE

Honor Board, Harvey Mudd College – *Chair (2020-2021)* October 2018 - Present

- Oversee 22 students on Harvey Mudd College's Honor Board, responsible for upholding the Honor Code.
- Chair hearings regarding Honor Code violations and mediate settlements between students and faculty.

PUBLICATIONS

- **Espinosa Dice N**, Kaye M, Ahmed H, Montañez G, "A Probabilistic Theory of Abductive Reasoning." *13th International Conference on Agents and Artificial Intelligence (ICAART 2021)*, 2021.
- [*Under Review*] Ramalingam R, **Espinosa Dice N**, Kaye M, Montañez G, "Generalization Bounds of Learning Algorithms Through Algorithm Capacity and a Geometric Representation of Bias." *33rd International Conference on Algorithmic Learning Theory (ALT 2022)*, 2022.

AWARDS

Harvey S. Mudd Merit Award, Harvey Mudd College, 2018 - Present
Awarded $10,000 yearly scholarship for "superior academic achievement and ability to contribute to the College."