# Nicolas Espinosa Dice

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## Education

**Harvey Mudd College**                                                       **Claremont, California**
*B.S., Mathematics and Computer Science, Major GPA: 3.90*                     *Expected May 2022*

Courses: Geometry of Big Data, Artificial Intelligence, Neural Networks, Mathematics
of Big Data, Algorithms, Algebraic Geometry, NLP with Deep Learning, Bayesian Statistics (Sp '22)

## Research Experience

**Department of Mathematics, Harvey Mudd College**                           **Claremont, California**
*Student Researcher, Geometric Deep Learning*                                *September 2021–Present*
Advisor: Weiqing Gu

○ Built a temporal graph convolutional network (T-GCN) model to detect seizures in electroencephalo-gram (EEG) data.
○ Working to integrate EEG and gait data with geometric deep learning methods to diagnose Parkinson's disease and analyze its progression.

**AMISTAD Lab**                                                               **Claremont, California**
*Student Researcher, Statistical Learning*                                   *October 2020–Present*
Advisor: George Montanez

○ Derived generalization error bounds of learning algorithms in terms of algorithm capacity by intro-ducing a novel geometric representation of algorithm bias.
○ Second author of paper under review at *33rd International Conference on Algorithmic Learning Theory (ALT 2022)*.

**AMISTAD Lab**                                                               **Claremont, California**
*Student Researcher, Graphical Models*                                       *May 2020–October 2020*
Advisor: George Montanez

○ Developed a probabilistic model of abductive reasoning using a Bayesian network that unifies selective and creative abduction and constructs common-cause explanations of observations.
○ First author of paper published at *13th International Conference on Agents and Artificial Intelligence (ICAART 2021)*.

## Industry Experience

**Clinic Program, Harvey Mudd College**                                      **Claremont, California**
*Project Manager*                                                            *September 2021–Present*

○ Building an unsupervised anomaly detection model on time-series marketing data through a dynamic regression model and a long short-term memory (LSTM) autoencoder.

**Etsy**                                                                     **Brooklyn, New York**
*Software Engineer Intern*                                                   *May 2021–August 2021*

○ Developed a transformer-based 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-based model that classifies search queries as broad or direct, increasing accuracy by 9% and reducing model volatility.

**Viasat**                                                                   **Carlsbad, California**
*Software Engineer Intern*                                                   *May 2019–August 2019*

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

## Publications

[1] [Under Review] Ramya Ramalingam, **Nicolas Espinosa Dice**, Megan Kaye, and George Montanez. Bounding generalization error through bias and capacity. In *Algorithmic Learning Theory*, 2022.

[2] **Nicolas Espinosa Dice**, Megan L Kaye, Hana Ahmed, and George D Montanez. A probabilistic theory of abductive reasoning. In *ICAART (2)*, pages 562–571, 2021.

## Teaching and Leadership Experience

**Honor Board**                                                                   **Claremont, California**
*Chair (2020-2021)*                                                               *October 2018–Present*
  ○ Oversaw 22 students on Harvey Mudd College's Honor Board, chaired hearings regarding Honor Code violations, and mediated settlements between students and faculty.

**Society of Professional Latinx in STEM**                                        **Claremont, California**
*Public Outreach Director (2019-2020)*                                            *September 2018–Present*
  ○ Led biweekly STEM tutoring sessions for high school students through HMC's Society of Professional Latinx in STEM and in partnership with Uncommon Good.

**Artificial Intelligence Course Assistant**                                      **Claremont, California**
*Grader and Tutor*                                                                *January 2021–May 2021*

## Scholarships

**Harvey S. Mudd Merit Award**                                                    **Claremont, California**
*Harvey Mudd College*                                                             *September 2018–Present*
  ○ $10,000/year scholarship for "superior academic achievement and ability to contribute to the College."

## Skills

**Languages**: English (Native Speaker), Spanish (Fluent)

**Programming Languages**: Python, C++, Java, SQL, R, Scala, C#

**Programming Libraries**: TensorFlow, PyTorch, Keras, Scikit-learn