Josue N. Rivera

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"I am a 21-year-old passionate computer scientist with an interest in machine learning, neural networks, image processing and 3D mapping. I am also an avid learner who looks for any opportunity that I can to learn and use the newly acquired knowledge for self-improvement and the betterment of the world around me."

EDUCATION

Master of Science | University of Massachusetts Dartmouth May 2020
- **Concentration:** Computer Science | **GPA:** 3.9
- **Thesis Topic:** Graph Induced Lifelong Learning for Spatial-Temporal Data (Extended to Fall 2020)
- **Courses Taken or Taking:** Algorithms and Complexity; Advanced Data Mining; Advanced Machine Learning; Advance Computer System; Database Design; Digital Forensic; Theoretical Computer Science

Bachelor | *Summa Cum Laude* | University of Massachusetts Dartmouth December 2019
- **Major:** Computer Science | **GPA:** 3.9
- **Honors, Leaderships and Awards:**
  - *Endeavor Scholar*: Prestigious scholarship given for academic merit, leadership, and civic engagement
  - *Newman Fellow*: Nationwide recognition given to change-makers and public problem-solvers
  - *29 Who Shine Award Recipient*: Award given by the Dept. of Higher Education and State Governor
  - *University Civic Engagement Award Recipient*: Given to a student who made an impact on the campus
  - *Chancellor's List*: Inducted into a list of students who have earned a GPA of 3.8 or higher

Lawrence High School Diploma | Math, Science and Technology High School June 2016
- **Honors, Leaderships and Awards**: *Valedictorian*; *L'Pin Award Recipient*

PROFESSIONAL EXPERIENCE

Grader/TA | Computer and Information Science Dept. - UMass Dartmouth January 2020 – March 2020
- Worked as a teaching assistant/grader for the course: CIS 322 - Data Structures and Fundamental Algorithms

Researcher | University of Texas at Dallas (*) May 2019 – August 2019
- Worked as a researcher at the University of Texas at Dallas through the National Science Foundation Research Experiences for Undergraduate (REU) Program and under the supervision of Dr. Eric Wong
- The team conducted a deep analysis on the reliability of various classical machine learning techniques, deep learning models and radiologists to provide empirical data that can either support or oppose the use of deep learning in critical situation where reliability is a priority

Research Assistant | University of Massachusetts Dartmouth September 2017 – May 2019
- Research assistant for Dr. Maoyuan Sun (Interests: Data Visualization and Human-Centered ML)
- Worked on numerous projects including the NSF-supported research: Visualizing Data Relationships Across Multiple Views. The project investigated methods for displaying relationships in data across multiple visualizations.

PAPERS

Ongoing Work | Graph Induced Lifelong Learning for Spatial-Temporal Data (*first author*) (**)
- Currently drafting a paper focused on my master thesis: a pair of novel graph neural network models that can perform lifelong learning on spatial and temporal data

Journal Publication & Conference | An Educational Tool for Exploring the Pumping Lemma Property for Regular Languages | FECS 2020 (*first author*)
- The research paper introduced an active learning tool coined [Mi]nimum [Pu]mping Length Educational Software (MIPU) that was designed to explore the pumping lemma property for regular languages

Abstract Presentation | A Comparison of the Reliability between Traditional Machine Learning Techniques and Deep Learning in the Classification of Breast Cancer | 2019 REU Symposium (*first author*) *

- The presentation was based on the research completed during my residence at University of Texas at Dallas, a deep analysis on the reliability of machine learning models and their support in critical settings

TECHNICAL EXPERIENCE

Master Thesis | Graph Induced Lifelong Learning for Spatial-Temporal Data ** August 2019 – Present

- Currently conducting research on lifelong learning (L2L) techniques for graphs and developing a set of L2L models (LIGN and R-LIGN) based on graph convolutional neural network (GCN) that serve as mapping functions for graph embedding based on similarities and differences between the nodes. These mapping functions are also used to remember and recognize known and unknown labels. R-LIGN can perform L2L on dynamic graphs that change in topology and contain both spatial and temporal data

Research | Predictive Frame Inference (PIF) Model January 2020 – May 2020

- Designed an encoder-decoder convolutional neural network that can generate in-between frames of a given video thus increasing frame rate. During the research, a high definition 25 fps video was increased to 50 fps without loss in resolution, reduced length of video or noticeable distortions

Software | SQL Database Engine January 2020 – May 2020

- Developed a database engine that can process SQL queries and apply standard optimization techniques like projection pushdown, selection pushdown and cross product to join conversion

Capstone Project | 3D Geometry Foot September 2018 – May 2019

- Conceived a classical machine learning algorithm that can reconstruct 3D models of human feet from images and find their measurements
- The project *3D Geometry Foot* consisted of a smartphone application that can scan and send data (images, phone rotation, etc.) to a server where the algorithm tries to reconstruct a model of the individual's feet

Video Game Development | Runner-Z January 2018 – May 2018

- Designed a video game for the Intellivision console of 1979
- The game incorporated modern game design concepts while working with the limitation of the hardware
- The game was completely written in BASIC with some Assembly for data management efficiency

TECHINICAL SKILL

Programming Languages, Libraries and Others:

- Fluent: *Python;* C; Java; HTML; CSS; JavaScript; Node.js; R; MATLAB; BASIC; SQL; Git; JSON; XML; OpenCV; *PyTorch; TensorFlow; Keras;* Unix commands; Linux systems
- Familiar: C++; PHP; jQuery; Bootstrap

Software:

- Fluent: Blender 3D; Arduino; Adobe Creative Cloud; Microsoft Office 365; VS Code
- Familiar: Android Studio; Tizen Studio; Unity 3D; Godot; Resolve; SolidWorks

Software Development Frameworks:

- Fluent: Scrum; Agile Development; UML; Unit Testing
- Familiar: Integration Testing

Languages:

- Fluent: Spanish; English

LEADERSHIP EXPERIENCE

Treasurer | UMass Dartmouth Big Data Club September 2018 – May 2020

- The club focused on building models to understand trends in large amount of data and designing new machine learning algorithms
- Competed in numerous hackathons/datathons at universities like Brown, Perkins, and Bryan

President | UMass Dartmouth Animation Club September 2017 – May 2020

- Led weekly meeting where we taught, discussed, and appreciated various kinds of animation styles including 2D, 3D and stop-motion
- Collaborated on the foundation of the Animation Club Annual Film Festival

Delegate | UMass Dartmouth Model United Nations September 2017 – May 2020

- Discussed global issues and possible solutions at the international week-long NMUN Conference in New York City

- Points of discussion have included: Improving Emergency Response Capacities to Safeguard Food Security and The Role of Urbanization in Sustainable Development

UMass Dartmouth Representative | Leduc Center for Civic Engagement September 2017 – May 2020

- Serve as the student representative that brings forth the opinions and concerns of the students on the work that is being done by the civic engagement community
- Led the Volunteer Expo event which introduced 100+ students to over 25 volunteering organizations

Senator | UMass Dartmouth Student Government Association September 2017 – May 2019

- Helped pass dozens of policies that positively affected students including financial funds for research
- As civic engagement chair, led campaigns to build volunteerism spirit among the students and assisted the Leduc Center for Civic Engagement with major events such as the Share the Harvest and Volunteer Expo

CIVIC ENGAGEMENT EXPERIENCE

CIS Mentor | CIS Department - UMass Dartmouth January 2019 – May 2020

- Volunteered to mentor/tutor undergraduate students in a wide range of computer science courses
- Dedicated 8+ hours weekly to assist students

Leduc Leader | Leduc Center for Civic Engagement September 2016 – May 2020

- Conducted and led community service events that got college students involve in their community
- Served over 20+ of community service weekly during the 2018-2019 academic year
- Gave over 20+ talks on the importance of community service and the benefits of volunteerism

Volunteer | Food Pantry: Arnie's Cupboard September 2016 – May 2020

- Helped provide food to students, staff, faculty, and community members in need at the university
- Previously, selected as volunteer of the year

STEM Teacher Volunteer | Fall River YMCA November 2016 – May 2019

- Taught the STEM class that involved computer programming, physics, engineering, and robotics
- One of the main projects consisted of a car the uses that energy stored in a mouse trap to move itself

HOBBIES

Pool/Billiard

- Amateur billiard player
- Champion of 2018 Annual Pool Tournament at UMass Dartmouth
- One of my favorite pass time of all time

Robotics/Electronics

- Former member and programming leader of FIRST Robotic Team 1289
- Former referee for FIRST Lego Robotic Competition
- Taught classes on electronics, robotics, and Arduino to high and middle schoolers
- Build PCs on my spare time

Web Design

- Developed various website using technology such as WebGL, HTML 5, CSS3, Bootstrap, etc.
- Designed the former website for FIRST Robotic Team 1289, my personal site, and various other pages

Golf

- Casual golf player
- Former member of the varsity team in high school. I have enjoyed the game ever since

Painting/Drawing

- Amateur artist
- Background in acrylic painting, but recently started doing more cartoony digital art

Game Design

- Created RunnerZ for the Intellivision console, a web based interactive version of the popular math game Nim and several other games in my spare time
- Experience with game engines such as Unity3D, Godot, Roblox Studio and WebGL based ones