

Josue N. Rivera

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"I am a passionate computer scientist with an interest in web development, machine learning, software engineering and theoretical computing. 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 (<https://josuenrivera.site/#experience>*)

Master of Science | University of Massachusetts Dartmouth 2021

- **Concentration:** Computer Science | **GPA:** 3.9
- **Thesis Topic:** Graph Induced Lifelong Learning for Spatial-Temporal Data (Extended to Spring 2021)
- **Courses Taken:** Algorithms and Complexity; Advanced Data Mining; Advanced Machine Learning; Advance Computer Systems; Database Design; Digital Forensic; Theoretical Computer Science

Bachelor | *Summa Cum Laude* | University of Massachusetts Dartmouth 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 2016

- **Honors, Leaderships and Awards:** *Valedictorian; L' Pin Award Recipient*

PROFESSIONAL EXPERIENCE (<https://josuenrivera.site/#experience>*)

Graduate Teaching Assistant | CIS Dept. - UMass Dartmouth January 2020 – Present

- Current teaching assistant (TA) & grader for the graduate courses: *Theoretical Computer Science* and *Advance Computer Systems*
- Former TA & grader for the undergraduate course: *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.

PUBLICATION (<https://josuenrivera.site/#experience>*)

Ongoing Work | Graph Induced Lifelong Learning for Spatial-Temporal Data (*first author*)

- Currently drafting a paper based on my master thesis: a pair of novel graph neural network models that can perform lifelong learning on spatial and temporal data. The

Book Chapter & Conference | An Educational Tool for Exploring the Pumping Lemma Property for Regular Languages | FECS 2020 (*first author*)

- The research paper introduces an active learning tool (MIPU) that was designed to explore the pumping lemma property for regular languages and build an intuitive understanding for determining irregular languages

Research Poster | A Comparison of the Reliability between Traditional Machine Learning Techniques and Deep Learning in the Classification of Breast Cancer | 2019 REUS (*first author*)

- Presented the research completed during my residency at University of Texas at Dallas, a deep analysis on the reliability of machine learning models and their roles in critical settings

TECHNICAL EXPERIENCE (<https://josuenrivera.site/#portfolio>*)

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

- Currently conducting research on lifelong learning (L2L) models based on graph theory and deep learning. During the research, a set of graph neural network models (LIGN and R-LIGN) are being developed that serve as mapping functions for graph embedding based on similarities and differences between the nodes. These can be used to recognize known labels and identify new one. R-LIGN can perform L2L on dynamic graphs that contain both spatial and temporal data

Neural Network Model | Predictive Frame Interpolation (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 the 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

Database System | SQL Database Engine January 2020 – May 2020

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

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

- Conceived a classical machine learning algorithm for a start-up 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

TECHNICAL SKILL

Programming Languages, Libraries and Others:

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

Software and Tools:

- Fluent: Github; VSCode; Blender 3D; Arduino; Godot; Adobe Creative Cloud; Microsoft Office 365
- Familiar: Android Studio; Tizen Studio; Unity 3D; 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 National Model United Nations (NMUN) Conference in New York City
- Previous points of discussion 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

- Served as the student representative that brought 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

Computer Science 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/Billiards

- Amateur billiards player
- Champion of 2018 Annual Pool Tournament at UMass Dartmouth

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 cartoony digital art

Game Design

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