Oliver Alvarado Rodriguez

Ph.D. Candidate
Department of Computer Science
Ying Wu College of Computing
New Jersey Institute of Technology
oaa9@njit.edu – 240.606.4436

EDUCATIONAL BACKGROUND

Degree	University	Field	Year
Ph.D.	New Jersey Institute of Technology	Computer Science	2024*
B.S., *Summa Cum Laude*	William Paterson University	Major: Computer Science Minor: Mathematics	2020

** Expected.*

EMPLOYMENT HISTORY

Research Assistant — New Jersey Institute of Technology — 05/2021 - Present

Designed, implemented, and analyzed algorithms for high performance graph and data analytics. Explored the research process from literature review through algorithm design, implementation, and performance optimization. Published algorithms and results in various conferences and journals such as IEEE's High Performance Extreme Computing conference and MDPI's Algorithms journal. A full list of publications can be found starting on page 4.

Teaching Assistant / Substitute Lecturer — New Jersey Institute of Technology — 09/2020 - 05/2021

Served as a substitute lecturer planning and delivering lessons for the course "CS103 Python for Business Problems". Instructed lab sessions for 50+ students to demonstrate the practicability of topics learned in lecture. Provided extra tutoring for 20+ students who struggled with the material presented in both lab and lecture. Assisted professor with grading all lab and homework assignments. Reviewed exam and lab results with students.

Data Science Intern — Chubb Insurance — 06/2020 - 08/2020

Researched machine learning classification algorithms best suited for text data. Comfortable with multiple Python libraries such as sci-kit learn, pandas, numpy, requests, and others. Created an API that pulled pertinent information from databases, predicted sex given at birth for insurance leads, and returned a new table for their sales team. Managed project through Chubb's enterprise GitHub and worked on an Agile software development schedule. Presented progress weekly to supervisor and larger data science team.

Research Assistant in Machine Learning — William Paterson University — 09/2019 - 06/2020

Utilized machine learning algorithms such as min-max normalization, k-means, k-nearest neighbors (knn), and linear regression for software performance prediction in digital signal processors. Converted machine learning techniques from Excel spreadsheets and R to Python. Implemented the SciKit and Pandas libraries in Python to preprocess data via min-max normalization and then perform

statistical analysis on the data with k-means, knn, and linear regression. Exported data to files and compared with previous iterations of results from Excel and R to confirm or reject the data. Managed SharePoint site for research communication and file sharing. Combined, reviewed, and refined out-of-date data files.

Computer Science Tutor — William Paterson University — 09/2019 - 05/2020

Tutored 6+ students weekly on subjects such as Computer Science 1 & 2, Data Structures, Hardware Fundamentals, Digital Logic, Networking, and Cloud Computing. Advised students regarding class registration, time management, and completing assignments. Taught students studying techniques to better their understanding of computer science concepts. Provided the tutor supervisor, Dr. Erh-Wen Hu, with feedback to aid students who required extra guidance. Gathered feedback from students and other tutors to better tutoring experiences and provide better service.

Web Development Intern — William Paterson University — 06/2019 - 05/2020

Accessed databases through the Toad for Oracle SQL application to create new tables and run queries in OracleSQL and utilized OracleDB. Maintained university enterprise applications through testing and monitoring user traffic. Developed enterprise web applications including a new search page that queries the university databases and utilizes Google's custom search engine to return specific web pages and a custom Google search. Programmed in HTML, CSS, JavaScript, jQuery, Adobe's ColdFusion, and SQL. Utilized web development frameworks such as Bootstrap 3 and 4. Collaborated with different departments at WPU such as Marketing and Public Relations to create responsive web applications that met student and staff standards. Learned new skills and techniques constantly to better the quality of web applications created. Assisted with the rollout of a new student interface for 10,000+ students, faculty, and staff through the university's homegrown WPConnect central communication hub. Trained 5+ clients to use the Qualtrics Survey Research Suite.

Research Assistant in Cryptography — William Paterson University — 09/2018 - 05/2019

Researched academic papers to gather information on the properties of feedback carry shift registers (FCSRs) and background information on cryptography and stream ciphers. Calculated the periods of AND-FCSR stream ciphers; those that utilize an AND gate to combine an initial sequence a with a coefficient q. Developed a C++ program to calculate the period of an XOR-FCSR stream cipher via brute forcefully finding the initial sequence a in a bitstream and finding the number of bits until the sequence a was repeated. Installed the NIST pseudorandom number generator statistical test suite in a UNIX environment. Analyzed bitstream files by utilizing the NIST suite and compiled generated data (p-values) into an Excel sheet for further visual analysis via graphs and tables. Presented positive findings at the 2019 Explorations Conference at WPU.

Technology Assistant/Supervisor/Student Manager — William Paterson University — 01/2017 - 06/2019

Supported 5+ faculty, staff, and students with Qualtrics surveys monthly for research experiments, human resource trainings, and miscellaneous survey builds. Presented and taught Qualtrics Survey Suite to students, faculty, and staff. Created a presentation for first year students and coordinated presentation times with multiple Pioneer Success Seminar professors. Assisted with rolling out Duo Mobile Multifactor Authentication to 1,000+ faculty/staff. Aided 7-10 clients daily with technological questions via answering Help Desk calls and documenting tickets on the SolarWinds Help Desk system. Oversaw 20+ technology assistants and shift supervisors to provide a technical knowledge resource. Trained 10+ newly hired technology assistants and promoted shift supervisors every academic year to answer Help Desk calls, complete Help Desk tickets, and provide exceptional customer service. Updated and mantained documentation consistently to provide accurate information to both end users and internal staff. Utilized Active Directory and Microsoft System Center Configuration Manager to manage computers on campus. Assisted with the reimaging of computers and subsequent deployment. Managed SharePoint site for intradepartmental communication.

SERVICE AND LEADERSHIP

Service or Leadership	Institution	Dates
Information Technology Advisory Committee	William Paterson University	06/2019-05/2020
Middle States Commission on Higher Education	William Paterson University	06/2019-05/2020
Committee 2022	William Paterson University	08/2017-05/2020

HONORS AND AWARDS

Honor or Award	Institution	Description	Years
Mathematics Research Community Participant	American Mathematical Society	Week-long workshop solving problem(s) related to hypergraphs. Acceptance rate of <50%.	2022
Omicron Omega Excellency in Computer Science	William Paterson University	Awarded to the highest-GPA graduating senior in computer science.	2020
Upsilon Pi Epsilon International Honor Society	William Paterson University	Admittance to computer science students who maintain at least a B average in all courses.	2019
Student Success Scholarship	William Paterson University	Extra monetary award given to students who maintain at least a B in all courses. Maintained yearly until graduation in 2020.	2017
Dean's List of the College of Science and Health	William Paterson University	To be added students needed to achieve a 3.5 GPA for each semester. Maintained semesterly until graduation in 2020.	2016
Honors College Scholar	William Paterson University	Students who achieved a stellar SAT score and GPA during high school were placed into the Honors College. Maintained status until graduation in 2020.	2016

TEACHING

Course	Institution	Number Students	Semester
Computer Science with Business Problems	New Jersey Institute of Technology	~50	F2020
Roadmap to Computing	New Jersey Institute of Technology	~50	S2021
Computer Science with Business Problems	New Jersey Institute of Technology	~25	S2021

RESEARCH

PUBLISHED JOURNAL PAPERS

1. Zhihui Du, Oliver Alvarado Rodriguez, Joseph Patchett, and David A. Bader. Interactive graph stream analytics in Arkouda. *Algorithms*, 14(8), 2021.

PUBLISHED BOOKS AND PARTS OF BOOKS

2. Zhihui Du, Oliver Alvarado Rodriguez, Joseph Patchett, and David A Bader. Interactive graph analytics in Arkouda. In David Bader, editor, *Massive Graph Analytics*, chapter 21, pages 549–589. Chapman and Hall/CRC, 2022.

PRESENTATIONS

CONFERENCE PRESENTATIONS

3. Oliver Alvardo Rodriguez, Zhihui Du, Joseph T. Patchett, Fuhuan Li, and David A. Bader. Arachne: An Arkouda package for large-scale graph analytics. In *The 26th Annual IEEE High Performance Extreme Computing Conference (HPEC), Virtual, September 19-23, 2022*, 2022.

4. Zhihui Du, Oliver Alvarado Rodriguez, and David A. Bader. Enabling exploratory large scale graph analytics through Arkouda. In *The 25th Annual IEEE High Performance Extreme Computing Conference (HPEC), Virtual, September 20-24, 2021*, 2021.

5. Zhihui Du, Oliver Alvarado Rodriguez, and David A. Bader. Large scale string analytics in Arkouda. In *The 25th Annual IEEE High Performance Extreme Computing Conference (HPEC), Virtual, September 20-24, 2021*, 2021.

6. Zhihui Du, Oliver Alvarado Rodriguez, David A. Bader, Michael Merrill, and William Reus. Exploratory large scale graph analytics in Arkouda. In *The 8th Annual Chapel Implementers and Users Workshop (CHIUW)*, June 2021.

7. Oliver Alvarado Rodriguez, Dev Dave, Weihua Liu, and Bogong Su. A study of machine learning inference benchmarks. In *2020 4th International Conference on Advances in Image Processing*, ICAIP 2020, page 167–171, New York, NY, USA, 2020. Association for Computing Machinery.

KEYNOTE PRESENTATIONS

8. Oliver Alvarado Rodriguez. Enabling exploratory large scale graph analytics through Arkouda. Academic Data Science Alliance Annual Meeting, March 2022.

OTHER RESEARCH PRESENTATIONS

9. Oliver Alvarado Rodriguez. Large-scale graph analytics in Arkouda. New Jersey Big Data Alliance Symposium, March 2021.

10. Oliver Alvarado Rodriguez, Oliver Nuñez, Dev Dave, and Kiho Lim. A comparative study on machine learning techniques for weather prediction. WPUNJ Explorations Conference, May 2020.

11. Oliver Alvarado Rodriguez, Jeffrey Albanese, and Weihua Liu. The statistical properties of xor-fcsrs. WPUNJ Explorations Conference, May 2019.

PERSONAL INFORMATION

LinkedIn: linkedin.com/in/oliver-alvarado-rod
ResearchGate: researchgate.net/profile/Oliver-Alvarado-Rodriguez
Google Scholar: scholar.google.com/citations?user=dV5vV3gAAAAJ&hl=en
GitHub: github.com/alvaradoo
Email: oaa9@njit.edu
Phone: 240.606.4436