

# ALYSSA MECZKOWSKA

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## EDUCATION

### St. John's University

Computer Science, B.S.

Queens, NY

August 2023 – May 2026

- GPA: 4.0

- Relevant Coursework: Advanced Data Structures, Database Management Systems, Software Design Methods, Discrete Math

## PROFESSIONAL EXPERIENCE

### Collins College of Professional Studies

Queens, NY

Quantum Computing Research Assistant

May 2025 – Present

- Build OMNeT++ simulations integrating CRYSTALS-Kyber Post Quantum Cryptography (PQC) with BB84 Quantum Key Distribution (QKD), developing C++ modules via liboqs and OpenSSL AES-256 to secure vehicular network key exchange
- Configure Ethernet, LTE/C-V2X, and high-mobility scenarios with INET and SimuLTE, analyzing latency, throughput, and cryptographic timings to comprehensively benchmark hybrid PQC–QKD performance

### Bukhari Lab

Queens, NY

Machine Learning Research Assistant

April 2025 – Present

- Collaborate with a team of 4 student researchers and a panel of practicing clinicians to develop a React/Node.js dashboard that allows clinicians to efficiently review and tag AI-predicted ICD/CPT codes for model retraining
- Design end-to-end NLP pipelines (spaCy + HuggingFace) to process EMR notes, extracting structured medical concepts
- Fine-tune BioBERT on 10K MIMIC-IV notes to detect burnout indicators, enabling early-warning alerts with a 0.84 F1 score

### Vázquez Group

Queens, NY

Cheminformatics Research Assistant

March 2025 – Present

- Compute geometries and vibrational spectra for 1,000+ molecules using B3LYP/6-31G, identifying and assembling a curated dataset of key conformers to support organic reaction outcome prediction
- Develop Random Forest and XGBoost models that achieve  $R^2 = 0.71$  for predicting keto-enol equilibrium constants
- Awarded research funding through the Clare Boothe Luce Summer Research Award

### Daisy Property Management

New York, NY

Operations Intern

May 2025 – August 2025

- Partnered with finance and payroll teams to build and optimize 3 end-to-end workflow automations, processing 5K+ documents in testing and development alone, reducing document processing time by 95% and minimizing manual handoffs
- Enhanced internal AI workflows by designing, developing, and refining API-driven queries, improving task accuracy while cutting manual intervention time from 3 days to under 5 minutes across core operations

### University Learning Commons

Queens, NY

Computer Science and Math Tutor

October 2024 – May 2025

- Provided 150+ hours of individualized CS/math instruction, boosting average student grades by 25% across 30+ repeat tutees
- Awarded ‘Tutor of the Month’ for developing interactive problem-solving modules that increased student engagement

## RESEARCH PROJECTS

### Medicaddie – AI Medical Coding Platform

Queens, NY

- Engineered a clinician review interface for AI-predicted medical codes, with an NSF-funded AI platform now entering testing with medical coders to enhance accuracy and accelerate healthcare billing

### The Utilization of Machine Learning Modeling for Predicting Significant Factors of Keto-Enol Tautomerization

Queens, NY

- Generated quantum chemistry-based molecular descriptors from B3LYP/6-31G\*\* calculations, applied feature selection to identify top predictors of keto-enol equilibrium constants, and trained Random Forest/XGBoost models ( $R^2 = 0.71$ )

### A Narrative-Driven Computational Framework for Clinician Burnout Surveillance

Queens, NY

- Developed a BioBERT-based NLP pipeline analyzing 10K MIMIC-IV physician notes to detect early indicators of clinician burnout, facilitating timely, evidence-based interventions that safeguard care quality in critical care environments

## LEADERSHIP

### ACM Student Chapter

Queens, NY

Social Media Coordinator

May 2025 – Present

- Lead chapter-wide digital engagement by managing a 150+ member Discord community and coordinating Instagram/LinkedIn content calendars—driving a 45% boost in post engagement and a 30% uptick in event attendance

### Student Technology Governance Group

Queens, NY

Board Member

October 2024 – Present

- Advocate on behalf of the student body for technology improvements, such as pushing for modern IDEs (IntelliJ, VS Code)
- Lead Wi-Fi upgrade initiatives across 3 academic buildings, boosting network uptime by 25% and reducing connectivity complaints

## PRESENTATIONS

Meczkowska, A., Vendome, A., Lindberg, G. E., & Vázquez, F. X. (2025). *The Utilization of Machine Learning Models for Predicting Significant Factors of Keto-Enol Tautomerization*. Poster presented at the MERCURY Conference, University of Pittsburgh, Pittsburgh, PA.

## TECHNICAL SKILLS

**Programming Languages:** Python, Java, C++, JavaScript, TypeScript, SQL, HTML/CSS

**Frameworks & Libraries:** React, TensorFlow, PyTorch, scikit-learn, BioBERT, HuggingFace, spaCy, pandas, NumPy

**Tools & Platforms:** Git/GitHub, Linux/Vim, Docker, Postman, PostgreSQL, Node.js, Jupyter, Psi4, Mimic III/IV