Miguel Angel Lopez

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Education

Virginia Tech Blacksburg, VA

Masters of Engineering in Computer Science *Expected – May 2026*

- **GPA:** Pending
- **Relevant Coursework:** Data and Algorithm Analysis, Database Management Systems, Ethics & Professionalism in CS

Bachelor of Science in Computer Science *Graduating – May 2025*

- **In Major GPA:** 3.55
- **Dean's List:** Fall 2021, Spring 2023, Fall 2023, Spring 2024
- **Relevant Coursework:** Data Structures and Algorithm, Data Structures, Computer Organization, Mobile Development

Experience

REU Code Theory and AI Research Fellowship June 2024 – Aug. 2024

University of Puerto Rico at Ponce *Ponce, PR*

- Developed a novel BCH syndrome-based belief propagation decoder achieving 0.0086 BER on 2M+ bits
- Created ML models for Puerto Rican wildlife classification using CNN and Wav2Vec transformer architectures
- Implemented biodiversity assessment tools using MFCCs and clustering algorithms
- Collaborated with biology department to automate species identification for 300+ bird and 16 frog species

Code Theory Research Assistant Fellowship Oct. 2023 – May 2024

Virginia Tech Math Department *Blacksburg, VA*

- Led programming efforts using Magma to analyze matrix tensor rank in finite fields
- Researched generalization methods for determining tensor rank of matrices
- Automated testing procedures for matrix analysis in finite field computations

Projects

Wildlife Call Database | *MariaDB, Python, SQL* Aug. 2024 – Present

- Leading GUI development and database connectivity for a wildlife sound repository system
- Designing normalized database schema for managing audio files and taxonomic data
- Implementing user authentication and CRUD operations for audio file management

Bio-Classifier & Biodiversity Assessment | *Python, TensorFlow, Signal Processing* June 2024 – Aug. 2024

- Developed ML models using CNNs and Wav2Vec transformers to classify 300+ Puerto Rican species
- Created biodiversity assessment tools using MFCCs and clustering algorithms for Simpson Biodiversity Index
- Led conservation efforts through automated species identification with high classification accuracy

BCH Syndrome-Based BP Decoder | *Python, Error Correction* June 2024 – Aug. 2024

- Implemented novel error correction decoder combining BCH codes with belief propagation algorithms
- Integrated syndrome computation with belief propagation achieving 0.0086 BER on 2M+ bits in 9.9 seconds
- Enhanced communication system reliability through improved error detection and correction methods

Pet Neurolocalization App | *Flutter, Dart* Jan. 2024 – Jun. 2024

- Leading development of cross-platform medical application with VT Veterinary Department
- Implementing fuzzy decision tree algorithms for veterinary diagnostics
- Managing communication between development team and veterinary stakeholders

Tutor Time App | *Android, Java* Nov. 2023 – Dec. 2023

- Developing tutoring platform using Android's ViewModel and LiveData architecture
- Implementing efficient navigation patterns with nav_graph for fragment management
- Leading development using GitHub for version control and team collaboration

Technical Skills

Languages: Java, Kotlin, SQL, Python, C, Dart, HTML/CSS
Technologies: TensorFlow, Flutter, Android SDK, MariaDB, Git
Concepts: Machine Learning, Mobile Development, Database Design, Error Correction Coding