Tyrell "Ty" To

tyrellto2000@gmail.com | tyrellto.github.io | linkedin.com/in/tyrellto

Summary

Recent Master's graduate in Electrical and Computer Engineering with a passion for AI/ML, specializing in Deep Learning, Computer Vision, and Image Processing. Over two years of research experience applying machine learning to complex issues like breast cancer diagnosis and water quality analysis. Proficient in Python and PyTorch, and adept at communicating complex technical concepts to non-technical staff, interdisciplinary peers, and academics.

Professional Experience

ML Breast Cancer Research Assistant, Marquette University - Milwaukee, WI January 2021 – August 2023

- Developed a patch-based ensemble learning approach for real-time breast cancer diagnosis during surgery
- Optimized techniques for a limited, imbalanced dataset, achieving 95% accuracy for cancer and normal tissue
- Published a conference paper and journal article based on investigative findings with over 1,000 peer views

AI Water Safety Research Assistant, Marquette University - Milwaukee, WI May 2022 – August 2022

- Led machine learning efforts to detect presence of lead, and copper in water with alternating current signals
- Improved accuracy with custom TensorFlow model: 97% MSE decrease, 4% R^2 gain on 20,000+ data points
- Conveyed model viability to stakeholders (General Electric) with a 10-slide Microsoft PowerPoint Presentation

Additional Experience

Remaining Useful Life Tool Prediction github.com/tyrellto/RUL-tool-prediction

- Ranked 1st of the class in the Foxconn Industrial AI Data Challenge to determine remaining useful tool life
- Minimized cutting tool vibration by 14%, using NumPy to keep essential vibration waveform features
- Implemented XGBoost, and linear regression for predictive modeling, reducing forecast error by 8%

Basketball Free Throw Prediction github.com/tyrellto/basketball-free-throw-prediction

- Managed a 4-member team in developing a CatBoost model for free-throw prediction with skeletal movement
- Oversaw data collection and processing with OpenPose, and Azure Kinect to capture 1,700+ throws
- Achieved 68% accuracy, demonstrating potential for future work as a proof of concept, completed in 6 months

Abdominal Trauma Detection github.com/tyrellto/ATD-challenge

- Applied 3D UNet and multi-head LSTM for organ segmentation in 2000+ CT scans and injury recognition
- Used PyTorch on 450 GB of DICOM data for an abdominal trauma classification model
- Gained significant expertise in advanced deep learning over a 3-month developmental project

Skills

Languages: Python, SQL, Java, MATLAB, C, C++, OpenGL
Frameworks: PyTorch, Tensorflow/Keras, XGBoost, NumPy, Pandas, OpenCV, Scikit-Learn, Scikit-Image

Education

Marquette University - Milwaukee, WI

- Master of Science in Electrical and Computer Engineering, GPA: 3.71/4.00 August 2023

Marquette University - Milwaukee, WI

- Bachelor of Science in Electrical and Computer Engineering, GPA: 3.82/4.00 May 2022

Publications

- To, Lu, Ye. "Deep learning classification of deep ultraviolet fluorescence images toward intra-operative margin assessment in breast cancer", Frontiers for Oncology 2023
- To, Gheshlaghi, Ye. "Deep Learning for Breast Cancer Classification of Deep Ultraviolet Fluorescence Images Toward Intra-Operative Margin Assessment", IEEE Engineering in Medicine and Biology Society 2022