Tyrell "Ty" To

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Education

Marquette University - Milwaukee, WI

- Master of Science in Electrical and Computer Engineering — August 2023
  GPA: 3.71/4.00, 5-Year Accelerated Degree Program Student
- Bachelor of Science in Electrical and Computer Engineering — May 2022
  GPA: 3.82/4.00, Dean's List 2018-2022

Experience

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

- Researched novel methods for breast cancer classification with the Medical College of Wisconsin
- Implemented a patch-based ensemble learning method for 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 my investigative findings

Research Analyst, **AI for Water Safety**, Marquette University - Milwaukee, WI — May 2022 – August 2022

- Led machine learning efforts to predict presence of lead, and copper in water with alternating current signals
- Conveyed model viability to stakeholders (General Electric), simplifying technical details into clear insights
- Identified challenges in cross-day prediction, suggesting variations in sensor readings
- Analyzed underlying factors to understand and improve predictability across different sample days

Projects

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 using Numpy/Pandas to keep essential vibration waveform features
- Implemented XGBoost, and linear regression for advanced predictive modeling, enhancing tool life forecasts

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

- Developed a CatBoost based approach for free-throw prediction from skeletal movement data
- Oversaw the data collection and model design process from prototype to delivery as the product owner
- Used OpenPose, Brekel Body v3, and Azure Kinect for advanced skeletal data capture and processing

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

- Deployed 3D UNet techniques for precise organ segmentation from CT volume scans
- Incorporated multi-head LSTM to optimize model's ability to recognize critical injury patterns
- Utilized PyTorch for injury classification in abdominal trauma cases using DICOM imaging data

Skills

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

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