Hanzhang (Henry) YIN

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EDUCATION

University of Rochester | Rochester, NY **Aug. 2021 - Jun. 2025**

- **Dual Degree**: B.S. in Computer Science & B.S. in Applied Mathematics
- **GPA:** 3.88/4.0 | **Hajim School of Engineering**

Honors & Awards: Magna Cum Laude, Dean List.

Brown | Brown University, RI **Sep. 2025 - Jun. 2027**

- **Degree**: Sc.M. Computer Science
- **GPA: - | Thomas J. Watson Sr. School of Computer Science**

Course Taken: Introduction to Computer Graphics, Learning & Sequential Decision Making

INTERNSHIP

KeeperAI | *Software Development Engineer Intern* **Jun. 2023 - Aug. 2023**

- Developed and enhanced front-end webpage designs using **JavaScript** and **Fluent UI**, integrating external **NLP AI chatbot** plugins to facilitate event scheduling within the Microsoft Teams app.
- Resolved security vulnerabilities in the user login verification module by redesigning **regular expressions**, significantly improving the efficiency of account verification between the website and database APIs.

PROJECTS

Robust QRCode Scanner & Decoder **Apr. 2024**

- QR Code Detection Process:
  - Implemented image preprocessing techniques, including ***Sauvola binarization***, to enhance QR code detection; Utilized size ratio and connected component analysis to identify unique finder patterns.
  - Established code bounding boxes by forming **a right-angle triangle base** according to the three corner squares of the QR code, accurately determining its location and orientation.
- Successfully decoded QR code contents, including URLs, text, and contact information. Achieved real-time display of results at approximately **20 frames per second**, enhanced by jitter mitigation through the application of a ***Kalman filter*** for stable tracking.

Classification of Tweets of Politicians from Northern Europe **Nov. 2023**

- Led a team in a **Kaggle Challenge** predicting the potential political inclination of Northern European politicians using different ML **classification models** (from libraries: *Sklearn, Google transformer* etc.) written in **Python:**
  - Integrated ***GloVe*** embeddings to preprocess text data, providing a robust vector representation as input for the ***BiLSTM* model**.
  - Evaluated multiple classification algorithms, including ***SVM, Stacking Classifier, Logistic Regression, Random Forest, Naïve Bayes, and RNN***. Achieved the highest accuracy with the ***SVM*** model, demonstrating superior performance compared to other classifiers.
  - Utilized *GridSearch* to explore various combinations of regularization constants, learning rates, and *TfidfVectorizer* conversion to optimize model accuracy.

Autonomy Robotics: UofR Robotics Club **Aug. 2021 - Jan. 2022**

- Attended the NASA Lunabotics Competition with Robotic Club teammates.
- Implemented navigation system's algorithm to run autonomy robots under **ROS** engine and **C++**.
  - Adapted the original ***Dijkstra algorithm*** to the ***A* tracking algorithm***, enhancing the robot's pathfinding capabilities and improving commuting accuracy and efficiency in virtual simulations.
  - Optimized the sensor detection functionality by implementing the ***Canny edge filter*** using *OpenCV*, leading to improved real-world path feature detection and instruction.

RESEARCH EXPERIENCE

Motion Prediction of 3D Mesh Movement (Early Stage) **Sep. 2025 - Present**

- Advised by Daniel Ritchie. We envision combining language models for semantic understanding, generative video models for motion reference, methods for linking these references to 3D object behaviors, and a lightweight language interface to formalize the process.

Image Compression and Generation Research **Jul. 2024 - Oct. 2024**

- Advised by Professor Yan Wang at *Tsinghua University*, and investigated the concatenation of pre-trained language models (***DCVC + DPS***) as a novel approach to video codecs.
- Evaluating the performance on the ImageNet-1k dataset using *FID* and *PSNR* metrics, exploring a new structural codec with enhanced capabilities for image and video denoising and generation.

PD and Hospice ML research **Feb. 2024 - Present**

- Advised by Professor Jiebo Luo at the *University of Rochester* to create large language model (***Bi-LSTM)*** and using different fundamental machine learning models (***Logistics Regression, LightGBM Regressor, Random forest Classifier , Naïve Bayesian Classifier, etc.***) to predict the mortality rate of patients under three distinct datasets: Admission, LongStay, and Panel (NOTE: this is a time series dataset) collaborating with URMC.

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- Compared the accuracy, sensitivity, recall, specificity, f1-score, f1-score, and AUC metrics of the Parkinson's Disease- with existing Medicare Hospice baseline, analyzing feature selection differences to uncover meaningful medical insights.

SKILLS / OTHER

- **Languages:** C /C++, Java, Python, C#, JavaScript, HTML, CSS, SQL, Rust, OCmal, etc
- **Technical Skills:** Data Structures, Object-Oriented Design, Databases, Web Development, Machine Vision, Machine Learning, Deep Learning, Transformers, CNN, RNN, etc.