Tian Yi Yang

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Education

University of Michigan Ann Arbor, MI

Bachelor of Engineering in Robotics and Computer Science *Aug. 2023 – May. 2027*

- Relevant Coursework: *Data Structures & Algorithms, Human-Robot Systems, Robot Operating Systems, Localization Mapping & Navigation, Robotics Dynamics & Simulation & Computer Organization*

Experience

Cybersecurity Intern - Software Development & Encryption June 2021 – Aug. 2022

Nasdaq Verafin Inc. *St. John's, NL*

- Led software development and testing, improving project alignment and software reliability, while enhancing data security through advanced encryption
- Optimized internal processes, refining database management for better decision-making
- Spearheaded the development of advanced fraud-detection software in Python, optimizing security protocols and integrating AML Detection software to automate email responses based on system alerts

Projects

pkr.img — Settlement App | *Next.js, TypeScript, FastAPI, SQLAlchemy, YOLOv8* Dec. 2025 – Present

github.com/TianYiY1103/pkr.img

- Built a real-time multi-user web platform for automated poker settlement with live dashboards and instant payout computation
- Architected full-stack system using Next.js frontend and FastAPI + SQLAlchemy backend with role-aware routing and persistent session state
- Implemented party-based session model and minimal transaction graph for Venmo settlement
- Integrated YOLO segmentation to detect and count individual poker chips from uploaded images, enabling automated chip recognition and scoring

Autonomous Exploration & SLAM | *C++, ROS2, SLAM Toolbox, A*, Frontier Detection* Nov. 2025

- Implemented autonomous exploration for MBot using SLAM Toolbox, frontier detection, and A* path planning in unknown environments
- Designed obstacle distance grids and safe navigation policies for collision-free exploration
- Developed frontier identification and exploration strategy enabling complete map coverage and autonomous escape from dynamic mazes
- Evaluated planning heuristics and optimized exploration using custom cost functions and state-machine logic

ROS-Based Inverse Kinematics & Motion Planning | *C++, ROS2, Gradient Descent* Mar. 2025 – Jun. 2025

- Developed an Inverse Kinematics (IK) solver using gradient descent and the geometric Jacobian, leveraging pseudoinverse-based iterative optimization to compute joint configurations for a target end-effector pose
- Built a ROS-style service node offering IK functionality: accepts a goal transform and returns the resulting joint configuration, convergence status, and optional debug trajectory
- Strengthened expertise in automation, control, and multidisciplinary engineering through hands-on project execution

610 FRC - Mechanical Design & Fabrication | *SolidWorks, Fusion360, Machining, Prototyping* 2019 – 2023

- Designed and fabricated mechanical subsystems using SolidWorks and Fusion 360
- Performed machining, assembly, and mechanical integration for competition robots
- Collaborated with controls & software teams to integrate hardware with autonomous systems

Technical Skills

Languages: C++, Python, Java, TypeScript, JavaScript, HTML/CSS
Frameworks & Platforms: ROS2, Next.js, React, FastAPI, Node.js
Computer Vision & ML: YOLOv8, OpenCV, TensorFlow, SciKit-Learn, NumPy, Matplotlib
Developer Tools: Git, VS Code, PyCharm, IntelliJ, Linux, SQLAlchemy
CAD & Design: SolidWorks, Siemens NX, Autodesk Fusion 360, Autodesk AutoCAD
Media Tools: Adobe Photoshop, Illustrator, Premiere Pro, Lightroom
Spoken Languages: English (Fluent), Chinese (Experienced), French (Experienced), Japanese (Intermediate)