Khai Yi **Chin**

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SUMMARY

Experienced in:
- Building real and simulation robotics software.
- Dynamic modeling, simulation and control theory.

Proficient in:
- C++, Python, ROS1 & ROS2; Linux OS.
- Presenting technical information, managing projects.

WORK EXPERIENCE

Robotics Engineer
Nov 2020 – July 2021

COAST Autonomous at Largo, FL
- Spearheaded development of a 3-D particle filter localization algorithm, with an octree-based likelihood field.
- Achieved real-time ±1 m localization precision along a >1,800 ft. outdoor trajectory in a >2 million sq. ft. map.
- Created deployment-ready, multi-platform (Windows and Linux) localization software libraries.
- Established and managed the company's robotics documentation and knowledge base.

Autonomous Robotics Engineer (Autonomy and Simulation Lead)
Mar 2019 – Oct 2020

SIERA.AI at Austin, TX
- Led R&D project of an industrial autonomous mobile robot (AMR) with 10,000 lbs tugging capacity.
- Designed software and workflow for AMR deployment involving SLAM, localization, and autonomous navigation.
- Achieved ±30 cm repeatability in infrastructure-free autonomous navigation of a >60,000 sq. ft. warehouse.
- Prevented AMR collisions during autonomous navigation through the integration of LiDARs and 3-D cameras.
- Improved AMR robustness by >30% through configuring, tuning, and implementing a fused odometry solution.
- Created software for performance benchmarking of different localization algorithms implemented on AMR.
- Enhanced AMR user experience by designing UI applications to provide robot and workflow management.
- Established a complete simulation stack to streamline robotics software testing using AWS RoboMaker and ROS.
- Facilitated knowledge transfer via preparation of technical documentation for engineers and customers.
- Provided new team members and interns with advice and mentorship.

Mechanical Engineer (Product Development)
Apr 2018 – Feb 2019

DunAn Precision, Inc. – R&D Division at Austin, TX
- Spearheaded mechanical design of 1st generation visual inertial measurement units (VIMUs) and test fixtures.
- Achieved in-house product assembly by implementing robotic and pneumatic systems.
- Improved VIMU accuracy by designing a sensor calibration program in MATLAB.
- Analyzed noise characteristics of gyroscopes and accelerometers of various IMUs.
- Investigated MEMS gyroscope designs using dynamical modeling in Simulink.

Graduate Research Assistant
May 2017 – Apr 2018

The University of Texas at Austin, TX
- Investigated properties of doped carbon nanotubes for development of cabling via computational modeling.
- Interpreted scientific literature for past research efforts and state-of-the-art carbon based materials/devices.
- Explored the physical significance of simulation data via band structure analyses and transmission functions.

Undergraduate Research Assistant
Nov 2014 – Jun 2016

Robotics and Motion Laboratory at Ann Arbor, MI
- Won the 2015 Prize for Contributions in Soft Robotics Research competition.
- Facilitated experimentation with automation using LabVIEW, a data acquisition device and a NI I2C bus.
- Designed and built a testbed using pressure sensors, solenoid valves and electrical circuitry for sensor testing.

EDUCATION

The University of Texas at Austin **2018**
M.S. in Mech. Engineering (Dynamic Sys. & Controls)

University of Michigan, Ann Arbor **2016**
B.S. in Engineering (Mechanical Engineering)

SKILLS

Languages: C++, Python, Bash, MATLAB, NodeJS.
Operating Systems: Linux, Windows.

Software: ROS1&2, Gazebo, AWS (RoboMaker, S3, Lambda, EC2), Git, Jira, Simulink, SolidWorks.

Resume updated 08/03/21

TEACHING AND LEADERSHIP

Programming Instructor Jan 2017 – May 2017
Graduates Linked with Undergraduate Experience (GLUE) Program
- Guided students in learning and improving their Python programming skills.
- Prepared educational resources to assist students in achieving their programming goals.

Logistics Director; Check-in Co-director for Midwest Games '15 Oct 2014 – Jul 2015
University of Michigan Malaysian Students' Association
- Led a team of students for the largest crowd volume sporting event for Malaysians in the US and Canada.
- Streamlined the check-in process of 1000 participants by systemizing participant information, spreading crowd volume across different stations.
- Planned large scale venue reservations for events via coordination and allocation of duties to team members.

PROJECTS

Modeling and Control of Torque Driven Robot – Intro to Modern Control Jan 2017 – May 2017
- Designed a finite horizon linear quadratic tracker for a UGV model for trajectory tracking in MATLAB.
- Achieved 90% accuracy by designing a reduced order observer for the tracker in MATLAB.
- Investigated and analyzed performance of a finite horizon vs. infinite horizon LQR on the UGV model.

Emergence in Machine Learning Algorithms – Self Initiated Project Course Jan 2017 – May 2017
- Achieved optimal planning solution of TSP by building the Ant Colony Optimization (ACO) algorithm in Python.
- Researched deterministic properties of machine learning algorithms by testing the ACO algorithm.

Design of Radiation Sensor Linkage on UGV – Robot Mechanism Design Sep 2016 – Dec 2016
- Improved linkage sweeping range by 50% through kinematic analyses on MATLAB.
- Designed 3D CAD model in Solidworks, integrated with parts and components from McMaster-Carr.
- Created engineering drawings for in-house machining and assembly of prototypes.

Parking Brake & Mount Design – University of Michigan Solar Car Team Jan 2014 – Oct 2014
- Won the 2014 American Solar Challenge by designing a parking brake, brake mount for solar car Quantum.
- Achieved brake design requirement of withstanding 10% of vehicle weight with Solidworks and Hypermesh.
- Collaborated with fellow engineers during the design process for optimizing dimensions and structural fitting.

PUBLICATIONS

Chin, K. Y., Fahrenthold, E. P., 2021. "Mass Specific Performance of Potassium Tetrabromoaurate as a Carbon Nanotube Dopant," *Computational Materials Science*, **197**, 110573.

Chin, K. Y., 2018. "Molecular Doping of Carbon Nanotube Conductors," *Masters Thesis*.

Felt, W., **Chin, K. Y.** and Remy, C. D., 2017. "Smart Braid Feedback for the Closed-Loop Control of Soft Robotic Systems," *Soft Robotics*, **4** (3), pp. 261-273.

Felt, W., **Chin, K. Y.** and Remy, C. D., 2016. "Contraction Sensing with Smart Braid McKibben Artificial Muscles," *IEEE/ASME Transactions on Mechatronics*, **21** (3), pp. 1201-1209.

Felt, W., **Chin, K. Y.** and Remy, C. D., 2016. "Self-Sensing Pneumatic Artificial Muscles for Feedback Control using the Inductance of "Smart Braids"," *Dynamic Walking 2016*, University of Michigan, Ann Arbor, MI.

Felt, W., **Chin, K. Y.** and Remy, C. D., 2015. "Dynamic Tracking of Joint Motion with Antagonized Smart Braids," *Fluid Power Innovation & Research Conference 2015 (FPIRC15)*, Chicago, IL.

AWARDS

SIERA.AI Peer-to-Peer Reward and Recognition	Mar 2020
SIERA.AI Peer-to-Peer Reward and Recognition	May 2019
UT Austin Research Merit Fellowship	2018
Soft Robotics Toolkit 2015 Prize for Contributions in Soft Robotics Research	2015
University of Michigan Dean's List Award	Dec 2014
University of Michigan Dean's List Award	Apr 2014
University of Michigan Dean's List Award	Dec 2013