

Jinger Chong

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EDUCATION

Massachusetts Institute of Technology

PhD Candidate in Mechanical Engineering | Advisor: Kamal Youcef-Toumi | GPA: 5.0/5.0

Cambridge, MA

Expected **May 2028**

- **Courses:** Visual Navigation for Autonomous Vehicles, Advances in Computer Vision, Algorithmic Human-Robot Interaction

MS in Mechanical Engineering | GPA: 5.0/5.0

Sep 2023 – May 2025

BS in Mechanical Engineering, Minors in Computer Science and Chinese | GPA: 4.8/5.0

Sep 2019 – May 2023

EXPERIENCE

MIT Mechatronics Research Lab, Research Assistant

Sep 2022 – Present

- Outperformed baselines including Motron (CVPR 2022) by **50 nats (KDE NLL)** with **8× fewer parameters** on probabilistic full-body motion prediction (Human3.6M), enabling real-time human intent estimation for safe human-robot collaboration
- Built a structured multitask variational Gaussian process with joint-dimension factorization and continuous 6D rotation representation, validated by empirical coverage analysis and ablations over kernel, inducing points, and latent dimensionality
- Designed and deployed an adjustable UR5 camera rig adopted lab-wide for validating perception and manipulation algorithms

GE Vernova Advanced Research Center, Computer Vision Research Intern

Jun 2026 – Aug 2026

- Reduced **inspector review volume by ~50%** by consolidating redundant detections into unique defects on wind turbine blades
- Developed visual localization for an inspection crawler along 50–75 m blades, chunked into overlapping windows, using COLMAP SfM with sequential ALIKED + LightGlue matching on perspective views rendered from equirectangular imagery
- Scaled matching up to ~1M candidate defect polygon pairs per blade with a cascaded coarse-to-fine geometric verification filter
- Delivered 2–5 hour per blade single-node pipeline slated for deployment, with invention disclosure under internal patent review

Microsoft, Mechanical Engineering Intern

Jun 2024 – Aug 2024

- Owned end-to-end design and prototyping of patent-pending hinge mechanism from concept through alpha, translating benchmarks and user studies into specifications and first-order models for spring selection, material choice, and friction tuning
- Honed in on target torque profile through iterative fabrication and measurement of 3D-printed and CNC-machined prototypes

MIT Introduction to Robotics, Teaching Assistant

Jan 2024 – May 2024

- Built embedded C++ and ESP32-S3 platforms for labs in motor control, kinematics, computer vision, ML, and sensor interface
- Revamped curriculum and lab handouts for 50+ student graduate robotics course, collaborating with 8 instructional staff

Rotor Technologies, Graduate Engineering Intern

Jun 2023 – Sep 2023

- Achieved **100:1 LiDAR compression** via H.265 encoding, enabling low-latency streaming for remotely-piloted helicopters
- Streamlined sensor testing without flight hardware by emulating onboard sensors from recorded video and packet captures
- Reduced real-time bandwidth by up to 3x via azimuth-level decimation and adaptive bitrate control

Rotor Technologies, Undergraduate Engineering Intern

Jun 2022 – Aug 2022

- Expanded subscale helicopter testing infrastructure for perception, flight controls, and data logging from 1 to 3 units
- Integrated onboard power and data systems and bridged EKF and airspeed data from PX4 to proprietary flight software

PUBLICATIONS, PATENTS & SERVICE

J. Chong, X. Zhang, K. Youcef-Toumi, “[Structured Multitask Gaussian Processes for Probabilistic Full-Body Human Motion Prediction](#),” *ICRA*, 2027, under review.

X. Zhang, J. Chong, K. Youcef-Toumi, “[How Does Perception Affect Safety: New Metrics and Strategy](#),” *ICRA*, 2024.

J. Chong, et al., “[Multi-Function Hinge](#),” U.S. Patent Application Publication No. US 2026/0143604 A1, 2026, pending.
Reviewer, *ICRA*, 2027.

PROJECTS

Autonomous Pool-Playing Robot, Robotic Manipulation (Outstanding Project)

Sep 2023 – Dec 2023

- Developed a physics-based simulation of a single-shot pool-playing robot, modeling cue dynamics, ball motion, and collisions
- Sank target balls consistently in randomized simulations using a heuristic task planner with IK and inverse dynamics control

Water Bottle Flipping Quadrotor, Underactuated Robotics

Feb 2023 – May 2023

- Demonstrated robust bottle-flipping across 4 fill levels (25–100%) using direct-collocation hybrid trajectory optimization
- Modeled quadrotor–bottle dynamics; formulated constraints for transitions, collisions, contact and impulse forces, and states

TECHNICAL SKILLS

Languages: Python, C++, MATLAB, Julia, LaTeX

Tools: PyTorch, GPyTorch, OpenCV, COLMAP, hloc, ROS, Drake, Eigen, NumPy, SciPy, scikit-learn, Libpcap, FFmpeg, Git

Hardware: Solidworks, Fusion 360, 3D printing, laser cutting, CNC, machining, soldering, electronics and sensor integration