

Yash Bagla

Systems Test Engineer | Highway Autonomy | Trajectory Generation | Decision Systems | Controls

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Google Scholar: <https://scholar.google.com/citations?user=UMaYu4IAAAJ&hl=en>

PROFESSIONAL SUMMARY

Robotics and autonomous systems engineer with 8+ years of experience in systems test, trajectory generation, behavior planning, controls, motion planning, applied machine learning, autonomy validation, and fleet-scale robotics software. Current work at Zoox focuses on highway autonomy deployment, decision-system quality, safety reviews, and LLM-assisted fleet triage. Inventor on 2 granted US patents, one published continuation application, and additional pending autonomous-systems patent applications; author or contributor on peer-reviewed robotics, controls, and AI publications; peer reviewer for IEEE T-ASE, IEEE RA-L, and ACL.

PATENTS, PUBLICATIONS, AND TECHNICAL SERVICE

PATENTS

- US12012123B2: Method and system for impact-based operation of an autonomous agent. Granted June 18, 2024. Link: <https://patents.google.com/patent/US12012123B2/en>
- US12441364B2: Method and system for impact-based operation of an autonomous agent. Granted October 14, 2025. Link: <https://patents.google.com/patent/US12441364B2/en>

PENDING PATENT APPLICATIONS

- US20260015011A1: Method and system for impact-based operation of an autonomous agent. Continuation application. Link: <https://patents.google.com/patent/US20260015011A1/en>
- Pending: Systems and methods for controlling a vehicle in lane convergence regions.
- Pending: Vector-based diagnostic classification system.

PUBLICATIONS

- ACC submission / arXiv 2026: Trajectory-Induced Self-Calibration for Hidden-Target Localization Through an Unknown-Pose Range-Bearing Relay. Link: <https://arxiv.org/abs/2608.09464>
- CDC submission / arXiv 2026: Excitation-Supervised Closed-Loop Self-Calibration and Target Seeking for an Unknown-Pose Range-Bearing Relay. Link: <https://arxiv.org/abs/2608.12528>
- DSCC 2019: On Receding Horizon Chance Constraint Motion Planning for Uncertain Multi-Agent Systems. Link: <https://doi.org/10.1115/DSCC2019-9237>
- CTI 2020: Fast Data-Driven Modeling of Hydraulic Clutch Control Pressure with Latch-State Classification and Gaussian Process Regression. Link: <https://arxiv.org/abs/2607.10477>
- NeurIPS 2026: Global PIQA: Evaluating physical commonsense reasoning across 100+ languages and cultures. Submitted; under review.
- Google Scholar: 36 citations, h-index 2, i10-index 2 as of July 2026.

TECHNICAL SERVICE

- Peer Reviewer, IEEE Transactions on Automation Science and Engineering; invited reviews in robotics, automation, and intelligent systems. Link: <https://www.ieee-ras.org/publications/t-ase/>
- Peer Reviewer, IEEE Robotics and Automation Letters; invited reviews in robotics and automation. Link: <https://www.ieee-ras.org/publications/ra-l/>
- Peer Reviewer, Association for Computational Linguistics; invited reviews in computational linguistics and AI. Link: <https://www.aclweb.org/portal/>
- Reviewer, ASME robotics, motion planning, and controls submissions.
- Member and speaker, Robotics Reading Group, Michigan State University.

TECHNICAL SKILLS

Autonomy: Trajectory generation, behavior planning, decision systems, collision avoidance, highway driving, autonomous pullover, safety review.
Robotics: Motion planning, controls, stochastic robotics, localization, multi-agent systems, receding-horizon planning, chance constraints.
Software: C++, Python, C, ROS, MATLAB, Git, Linux, Docker, GStreamer, LaTeX.
Machine Learning and AI: LLM fleet triage, Gaussian processes, TensorFlow, Keras, scikit-learn, OpenCV, CUDA, model evaluation.

PROFESSIONAL EXPERIENCE

Systems Test Engineer - Urban and Highway Driving | Zoox | Foster City, CA | October 2023 - Present

- Helped deploy Zoox robo-taxi autonomy on highways and supported expansion of a major highway geofence through feature validation, safety review, and system-level testing.
- Hold the highest autonomous highway-driving mileage among Zoox individual contributors, based on internal highway-driving experience.
- Developed decision strategies for lane-convergence and zipper-merge behavior in urban and high-speed driving contexts; associated patent matter pending.
- Build LLM-assisted workflows for automatic failure triage, issue categorization, and root-cause routing from fleet data to autonomy teams.
- Conduct safety reviews for autonomous pullover, passenger pickup and dropoff behavior, and collision-avoidance scenarios.

Robotics Engineer | Advanced Robotics Group | Houston, TX | February 2023 - October 2023

- Developed navigation and collision-avoidance algorithms for underwater robots operating in confined, low-visibility industrial environments.
- Designed autonomy behavior using ultrasonic sensing where camera visibility was unreliable or unavailable.

Robotics Engineer II - Behavior Planning and Controls | May Mobility | Ann Arbor, MI | January 2021 - February 2023

- Worked on a Multi-Policy Decision Making framework for autonomous-vehicle policy evaluation using progress, collision risk, blame, time-to-collision, and interaction metrics.
- Developed an impact-based penalty formulation for autonomous agents impeding or blocking other agents; associated patent granted as US 12,012,123.
- Implemented planner behavior for free-space planning, unprotected turns, adaptive cruise control target selection, Bezier-curve libraries, in-lane maneuvers, and obstacle passing.
- Deployed lateral collision-avoidance strategies to reduce close calls and improve behavior around nearby agents.

Perception Engineer | Agot AI | Dallas, TX | August 2020 - January 2021

- Developed computer-vision systems for restaurant order-accuracy monitoring using multi-camera video, depth data, lidar inputs, and Dockerized GStreamer pipelines.
- Implemented action-recognition models using YOWO and YOLOv4 to classify employee actions from video streams.

Graduate Controls Engineer | Drive System Design, Inc. | Farmington Hills, MI | February 2019 - July 2020

- Built controls and machine-learning models for mechanical and hydraulic systems, including production-oriented deployment, testing, and scaling workflows.
- Modeled hydraulic clutch control pressure using latch-state classification and Gaussian Process regression; arXiv version available as arXiv:2607.10477.

Inspire Controls Intern | Altair Engineering | Troy, MI | May 2018 - August 2018

- Created robotic vision and motor-control algorithms for an autonomous air-hockey table that tracked and struck a puck in real time.

SELECTED PROJECTS AND RESEARCH

Multi-Agent Chance-Constrained Motion Planning | Michigan State University | Advisor: Prof. Vaibhav Srivastava

Project page: <https://yashbagla321.github.io/research/multi-agent-ccrrt/>

GitHub: <https://github.com/yashbagla321/Multi-agent-CCRRT>

- Developed receding-horizon CC-RRT planning for uncertain multi-agent systems with priority-ordered trajectory prediction, Monte Carlo collision estimation, Kalman covariance updates, and lazy feasibility checks.
- Implemented coordination behavior where lower-priority robots yield or take longer paths to preserve feasibility for priority agents under uncertainty.
- Publication: On Receding Horizon Chance Constraint Motion Planning for Uncertain Multi-Agent Systems, DSCC 2019. Link: <https://doi.org/10.1115/DSCC2019-9237>

Adaptive Localization Using Unknown-Pose Range-Bearing Relays | Michigan State University | Advisor: Prof. Hassan Khalil

Project page: <https://yashbagla321.github.io/research/adaptive-localization/>

- Developed hidden-target localization methods for unknown-pose range-bearing relays; ACC submission establishes trajectory-induced self-calibration from informative robot motion. Link: <https://arxiv.org/abs/2608.09464>
- Formulated excitation-supervised closed-loop target seeking where trajectory-spread certification governs when to explore and when to pursue the evolving target estimate. Link: <https://arxiv.org/abs/2608.12528>

Hydraulic Clutch Control Pressure Modeling | Drive System Design

arXiv: <https://arxiv.org/abs/2607.10477>

- Developed a data-driven hydraulic pressure model combining latch-state classification with local Gaussian Process regression for nonlinear clutch-control dynamics.
- Used current-derivative features and nonlinear classification to separate latch-related operating regimes before fitting partitioned regression models.
- Compared the machine-learning plant model against a physics-based Amesim model on unseen ramp-rate data.

Real-Time Model Learning for Robots | Michigan State University | Advisor: Prof. Jiayu Zhou

- Implemented local Gaussian-process regression to approximate robot dynamics and model nonlinear error terms for a 7-DOF robot.

EDUCATION

M.S. Mechanical Engineering, Robotics and Controls | Michigan State University | East Lansing, MI | January 2018 - December 2019

- Coursework included stochastic robotics, machine learning, robotics perception, stochastic optimal control, adaptive control, and nonlinear control.

B.S. Physics | Indian Institute of Technology Kanpur | Kanpur, India | July 2012 - May 2017

- Training in optics, electrodynamics, statistical mechanics, classical mechanics, computational physics, and C++ programming.

LEADERSHIP, MENTORSHIP, AND AWARDS

- Mentor for 10+ IIT Kanpur students and early-career engineers across engineering, computing, science, research direction, internships, technical portfolios, and interview preparation. Link: <https://yashbagla321.github.io/impact/mentoring/>
- Batch Coordinator, IIT Kanpur Class of 2016 Alumni Reunion; support alumni outreach, reunion coordination, class participation, and fundraising engagement. Link: <https://yashbagla321.github.io/impact/alumni-leadership/>
- Team Leader and Coordinator, KOS Dance Club, IIT Kanpur; led a 30-student team, organized large campus events, and represented IIT Kanpur in national competitions.
- Global Initiatives Tuition Fellowship, George Washington University, 2017.
- Inspire Scholarship, IIT Kanpur, 2013.