Bo Shang

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Engineer who translates cutting-edge technology into usable solutions. Years of experience taking AI and robotics systems from research prototype to fielded delivery for real infrastructure and transportation problems. Comfortable scoping a problem, defining what success looks like, building the system, and iterating based on how it performs in the field and what end users actually need.

Experience

- **City University of New York — AI & Mobility Research Lab** — New York, NY
  Solutions Engineer — Autonomous Vehicles & Traffic Safety — *Jul 2025 – Present*
  - Working on **AI-powered vulnerable road user (VRU) safety monitoring** from fixed roadside LiDAR, framed around a real question: how can cities better understand pedestrian and cyclist safety at intersections?
  - Evaluating and tuning 3D object detectors on roadside LiDAR; built a configuration-portable pipeline so a model trained at one site transfers to another with different sensor settings
  - Coordinated with field teams on data collection and validation; iterated on the system based on real-world sensor constraints
  - Co-authored two MobiSPC 2025 papers and a CVPR 2026 workshop paper framing roadside LiDAR as auditable infrastructure intelligence for traffic safety
- **City University of New York — Robotics Lab** — New York, NY
  Solutions Engineer — Infrastructure Inspection — *Dec 2022 – Dec 2024*
  - **Owned end-to-end delivery** of a robotic bridge-inspection system: from robot-collected imagery through processing to a platform that puts results in front of end users
  - Built a **WebODM-based inspection platform** integrating automated segmentation, AI-based defect detection, 3D reconstruction, interactive visualization, and crack measurement
  - Trained CNNs for crack, spalling, and stain detection and deployed them to AWS for scalable cloud inference
  - Worked across the stack and the team—structural-engineering collaborators, data, and software—to take the system from prototype to something usable by non-experts
  - Equal-first-author IROS 2025 paper (IEEE T-ASE 2025) on robotic inspection and analytics for structural defects
- **Missouri University of Science and Technology** — Rolla, MO
  Field Systems Engineer — *Jan 2020 – Nov 2022*
  - Worked on an **autonomous bridge-inspection drone**: designed image-processing algorithms for girder detection (OpenCV, C++) on NVIDIA Jetson edge hardware
  - Built a **visual-odometry data-quality evaluation** for an indoor flying-robot perching task; integrated VICON motion capture for GPS-denied flight stability
  - Iterated on algorithms and hardware based on real-world test conditions and observed failure modes
- **Vaughn College of Aeronautics and Technology** — New York, NY
  Technical Instructor — *2023 – 2024*
  - Taught applied AI systems and robotics control; mentored students on translating technical solutions into real-world applications
- **University of California, Merced** — Merced, CA
  Solutions-Focused Systems Engineer — *Sep 2015 – Sep 2017*
  - Co-led **SmartCaveDrone** (ICUAS'17), an autonomous SLAM platform for GPS-denied cave exploration; fused IMU with KinectFusion-style dense visual SLAM
  - Computer-vision-aided localization on embedded Linux UAVs; tested in real caves and iterated on the design based on field experience

Solutions Delivered

- **Bridge Inspection Platform**: Delivered an end-to-end AI inspection solution: a WebODM-based platform integrating drone/robot imagery, automated defect detection, 3D reconstruction, interactive visualization, and crack measurement for delivery to end users.
- **Automated Defect Detection**: Trained and deployed CNN models for crack/spalling/stain detection from drone imagery on AWS, integrated into the inspection platform so non-experts can review results.
- **Roadside-LiDAR Traffic Safety Monitoring**: Building a vulnerable-road-user monitoring approach on fixed roadside LiDAR, with a configuration-portable pipeline and published framing of LiDAR as auditable V2X infrastructure intelligence.
- **Autonomous Bridge-Inspection Drone**: Developed perception (girder detection on NVIDIA Jetson) and field-stability tooling for an autonomous bridge-inspection drone; iterated on the design through real-world testing.

Core Competencies

- **Customer Problem-Solving**: Problem scoping, requirements gathering, stakeholder management, defining success metrics, iterative validation, customer feedback loops
- **Cross-Functional Leadership**: Coordinating data scientists, engineers, product teams, customers; translating technical capabilities into business outcomes
- **Field Validation & Deployment**: Field testing protocols, data collection in real environments, failure-mode analysis, customer training and support
- **Technical Breadth**: AI/ML systems, robotics, autonomous systems, infrastructure, data pipelines, cloud deployment (AWS), edge computing (Jetson)
- **Product Thinking**: User experience design, platform architecture, iterative improvement based on user feedback, shipping products that operators love
- **Industry Domain**: Transportation, infrastructure inspection, bridge engineering, autonomous vehicle safety, city operations
- **Programming**: Python, C++, MATLAB; Docker, AWS, Linux, Git/GitHub Actions

Education

- **Northeastern University & University of California, Merced** — Shenyang, China / Merced, CA
  Ph.D. in Pattern Recognition & Intelligent Systems — *Aug 2013 – Dec 2020*
- **Northeastern University** — Shenyang, China
  M.Eng. in Pattern Recognition & Intelligent Systems; B.Eng. in Automation — *Aug 2007 – Dec 2013*

Selected Publications & Patents

- **Bo Shang**, Y. Li. *Roadside LiDAR for Cooperative Safety Auditing at Urban Intersections: Toward Auditable V2X Infrastructure Intelligence.* CVPR 2026 Workshops (DriveX). *[first author]*
- J. Feng, **B. Shang**, et al. *Robotic Inspection and Data Analytics to Localize and Visualize the Structural Defects of Concrete Infrastructure.* IEEE T-ASE 2025. *[equal first author; selected for IROS 2025]*
- **US 12,296,994** (granted May 2025) — Unmanned vehicle system design and deployment
- **Best System Control** & **Best Mission Planning** Awards — International Aerial Robotics Competition (AUVSI), 2014