dheeravenkatraman

robotics | perception | machine learning | dheera@dheera.net | github: dheera

objective

Research and explore disruptive innovations in robotics, machine learning, computer vision, and imaging. Strong interests in autonomous vehicles, environment- and sustainability-related applications, entrepreneurship, and Asia development. US citizen.

education

Massachusetts Institute of Technology (MIT)
Ph.D. Electrical Engineering 2015 | M.Eng. EE 2007 | S.B. Physics 2007 | S.B. EECS 2006

skills

Human Languages	English, Chinese/Mandarin, and basic level German
Computer Languages	Python, C, C++, JavaScript/NodeJS, Java, SQL, HTML, CSS, LaTeX
Frameworks	TensorFlow, PyTorch, ROS, ROS2, OpenCV, Flask, Tornado, Express
Algorithms	SOTA neural networks for object detection, segmentation, denoising, monocular depth estimation, and vision-/lidar-based tasks, classical machine learning techniques, sensor fusion, path planning
Theoretical	Signals and systems, stochastic processing, quantum optics/mechanics
Experimental	Robotics prototyping, system design and architecture, microcontrollers, basic DIY EE skills, optics

recent experience

Freedom Robotics | Robotics Software Engineer | San Francisco, CA, USA | 2020-present
Architected/implemented the on-prem part of an enterprise robot monitoring solution currently deployed with a top 10 auto manufacturer.

Robby Technologies (Y Combinator S16) | Co-Founder and CTO | Palo Alto, CA, USA | 2016-2020
Scaled the company from hand-building the first few robots to leading a team of engineers to design, manufacture, and deploy a fleet of autonomous sidewalk delivery vehicles in the Bay Area. Implemented a full perception stack including object detection, segmentation, and tracking and associated data collection and training pipelines. Designed and implemented a novel, robust semantic localization algorithm.

Virtulus | Co-Founder and CTO | Cambridge, MA, USA | 2015
Implemented a location-based search engine designed to crawl information from the APIs of multiple mobile apps and deliver near-real-time information at the right place/time to the user, ranging from restaurant public transit arrival times to menus to social media trends.

MIT RLE Optical and Quantum Communications Group | Research Assistant | Cambridge, MA, USA | 2007-2014
Ph.D. research. Responsible for the experimental implementation of a single-photon LIDAR that was published in Science.

MIT-China Innovation and Entrepreneurship Forum (MIT-CHIEF) | Founding Team Member and Technology Director | 2011-2013
Responsible for technical conference infrastructure and logistics for the first 2 years, including a database-backed website, registration system, on-site kiosk displays, bilingual marketing and conference materials, video production, photography, and graphic design.

MIT Sustainability Summit | Technology and Marketing Director | 2009-2014
Managed the technical infrastructure for the conference, and built a database-backed, mobile-friendly HTML5 conference app (one of the first to exist at the time) which eliminated the necessity for printed conference programs. Also managed marketing for the conference.

a few of my side projects ...

Clubsearch.io: Reverse-engineered the Clubhouse internal API and built a multi-lingual Clubhouse room search engine
ROSshow: Visualize ROS topics and sensor data (including images, LIDAR scans, and point clouds!) in a terminal with ASCII/Unicode art
DIY camera-based ADAS / lane keep system implemented on an actual car from scratch (NVIDIA AGX Xavier-based) (not comma.ai!)
Astrophotography denoising with neural networks to reduce the length of my imaging sessions
Indoor self-driving trash can robot to reduce the number of trash cans I need at home (LIDAR SLAM-based)
BotParty: Built 10 WebRTC-based telepresence robots for <$120 in parts each, for telepresence gatherings during the COVID pandemic
Digital 4x5 back Gigapixel camera that scans and auto-stitches the image plane of a 4x5 view camera with an IMX477 sensor
Luxo: A servo-activated robotic Pixar lamp that actually jumps
High-res, wide angle thermal landscapes to visualize geological forces at work in Iceland