Rakesh Gupta

20544 Debbie Lane, Saratoga, CA 95070 phone: (408) 872 1974
http://alumni.media.mit.edu/~rgupta/projects email: rakeshgupta@gmail.com

Summary

Senior technology leader with extensive software experience, building, and leading teams. Built software products and prototypes in Robotics, AI, Machine Learning, Deep Learning, Computer Vision, Spoken Dialog, and NLP. Working with startup technology and business models.

Experience

SAIC Capital, Menlo Park, CA

Partner *July 2022 - present*

- Identifying and making Venture Capital investments in transportation areas including Deep Tech, AI, batteries, sensors, mobility, and energy.

Senior Director of Technology *April 2020 - June 2022*

- Member of SAIC Capital VC team and investment decision committee making investments in mobility, sensors, AI chips, software, cybersecurity, and disruptive technologies.
- Evaluating technology and business models. Transformed decision process rigor with detailed technology, competition, and business model analysis. AUM: $200M

SAIC Innovation Center, San Jose, CA

Director of Autonomous Driving *May 2016 - March 2020*

- Built the US autonomous driving department from scratch to 35+. Lead four L4 shared mobility divisions - Perception, Mapping & Localization; Motion Planning & Control; System Integration; Testing & Validation.
- Delivered 50x improvement in CA DMV reported disengagement rate in 2019 over the previous year to 55 miles/disengagement news link.
- Deployed L4 shuttle on UC, Davis campus within 2 years on an aggressive timeline. We built a 6-seat custom shuttle with GPS, lidar, radar, cameras, and a full AD stack video link.
- Developed complex urban driving features such as stop sign intersections, traffic lights, nudging, and lane change.
- Built product critical technologies such as lidar sensing with deep learning, sensor fusion to detect and track objects, HD lidar maps for AD, and visual-inertial odometry maps for parking, policies at intersections & pedestrian crossings, and trajectory optimization.
- Created a simulation test framework to detect issues before road testing. Led cloud simulation runs to improve system robustness to new scenarios. Built an independent system to handle hardware failures.
- Member of SAIC Capital VC team and investment decision committee.

Honda Research Institute USA, Inc., Mountain View, CA

Principal Computer Scientist *July 2007 - April 2016*

Head of Machine Learning/AI collaborating with distributed teams, and universities. Projects include:

Autonomous Vehicles: Led the team for autonomous driving algorithm development with a focus on camera and 4-beam lidar sensing, HD mapping, and GPS localization. Individual contribution to path planning and reactive behavior. Extensive testing in urban environments. Initiated decision-making at intersections using Monte Carlo Search Trees with Stanford.

Spoken Dialog: Led the team for a free-form dialog system for setting the destination in a car. Developed a probabilistic model to track the dialog state, modeling user goal belief over multiple turns. Incorporated destination landmark and demonstrated via an Android app. Transferred prototype to the product group.

Wheelchair Robot: Led the team for assistive features on a wheelchair robot. Added hardware modifications and motor for auto-steering. Detected people and objects using depth and vision sensors. Modeled beliefs about entity locations, and used reinforcement learning to learn navigation and interaction policies.

Destination prediction: Team leader for GPS data collection and destination prediction. We used data for probabilistic route prediction using Inverse Reinforcement Learning. Predicted personal travel time for an electric vehicle to address range anxiety.

Hybrid fuel efficiency: Team leader for Applied Machine Learning project on route for optimal battery and engine power mix for fuel efficiency. We simulated system dynamics and battery charge to yield an average of 1.2% savings without any change in user behavior.

Senior Computer Scientist
Simultaneous Localization and Mapping (SLAM): Developed a single camera algorithm incorporating feature descriptors from multiple views. Built a 3D map of the environment from the camera and 2D lidar. Demonstrated localization on a mobile robot. Created 3D maps from depth fields using an active unstructured light space-time stereo system with improved accuracy.

Natural Language Processing (NLP): Integrated knowledge from Wikipedia, Yahoo Question/Answers, Open Directory Project, and OpenMind to improve topic recognition. Achieved a 48% error reduction over the state of the art on Google Answers and Switchboard datasets.
Created OpenMind Indoor Common Sense project to collect text data from volunteers. Collected data used in-house and at Intel Research, MIT Media Lab, and Technische Universität München.

Schlumberger Austin Product Center, Austin, TX

Senior Software Engineer
Designed and wrote software in the Graphics and Modeling group. Worked on a 3D Modeler project for the creation and visualization of geometric models for geological structures. Created models by extracting fault and horizon surfaces from field data. Triangulated these surfaces and intersected them topologically to compute volume properties. Coded volume visualization of attribute data.

Managed an offshore team of 20 developers working on software components.

Massachusetts Institute of Technology, Cambridge, MA

Research Assistant
Officer of the Deck Virtual Environment Training: Developed a C++ object-oriented framework for a Navy submarine project. Supported blackboard asynchronous architecture for communication with modalities such as speech, Head Mounted Display, Beachtron sound spatialization, and submarine dynamics model.

Education

Venture Capital, Berkeley Executive Education, CA

Massachusetts Institute of Technology, Cambridge, MA

Ph.D., M.S., Mechanical Engineering
GPA 5.0/5.0
Ph.D. research focused on experiments with human subjects comparing their performance in real and Multimodal Virtual Environments. Developed a real-time, interactive, dynamic simulation model incorporating visual, haptics with force feedback, and auditory modes.

Indian Institute of Technology, New Delhi, India

Bachelor of Technology, Mechanical Engineering
GPA 9.6/10.0

Memberships/Resident Status

Member IEEE, ACM, AAAI, ACL
US Citizen