

PRADEEP KADUBANDI

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SUMMARY

Aspire to solve customer/business problems by influencing technology through research and engineering. 2 years of Hands-on machine learning and robotics research experience. Seasoned Software Engineer with 13+ years experience at Microsoft & Oracle.

EXPERIENCE

Principal Machine Learning Engineer, Cognitiv.ai

Jan 2021 - Present

- Cognitiv brings deep learning to programmatic ad bidding.
- Leading a cross group with focus on optimizing campaign performance.
- Led the short term efforts to use multi armed bandits to improve intelligent creative selection, smart budget allocation.
- Investigated and working on data pipelines to unblock long term efforts.

Research Assistant, ICAROS @ USC lead by Prof. Stefanos Nikolaidis

Jan 2020 - Apr 2020

- Developed features in wecook (5000 lines, open source c++ project for autonomous cooking) and delivered end to end robot demo using kinova 6-dof jaco arm for research paper submission within a tight deadline of 2 weeks.
- Tasks done - Implemented ROS publisher/subscriber nodes; Worked with rviz and ROS ecosystem tools; Integrated apriltags detections for object identification and localization. Contributions: <https://github.com/icaros-usc/wecook/pull/20>

Research Assistant, RESL @ USC lead by Prof. Gaurav Sukhatme

Oct 2019 - Jan 2021

- Primary Researcher of the project: Motion Planner Guided Visuomotor Policy Learning.
- Conducted research experiments in 2 different problem settings with results. Owned the data generation pipeline. Hands-on with MuJoCo and OpenAI Gym.
- Implemented various neural network architectures like CNNs, Deep Auto Encoders, Robotic Policies using Multi Layer Perceptrons, Variational Auto Encoders using pytorch.
- Hands-on working with applying deep learning techniques to Images.
- Paper accepted to MLMP workshop in ICRA'21: <https://pradeepkadubandi.github.io/publications/>
- Project Github: <https://github.com/PradeepKadubandi/DemoPlanner>

Senior Software Engineer, Microsoft

Feb 2008 - Aug 2018

- Led 3-person feature crew to build entity management micro service for Azure Service Bus (a highly scalable distributed messaging service in Microsoft Azure) from scratch.
- Conducted Architectural Design, Work Item break up, prioritization and planning, ensured high quality outcome through design and code reviews for the project. The new micro service handled 3-fold growth of existing production workload.
- Ninja implementer of Custom Store Provider for Durable Task Framework using Service Fabric Reliable Collections (open source) - most complex piece and core pillar of the project. 5000+ new lines of high quality code in the span of two months. Commits: <https://github.com/PradeepKadubandi/durabletask/commits?author=PradeepKadubandi>
- Driven and delivered features in Microsoft ASP.NET and Visual Studio Web Developer Tools across several releases over 5 years . Developed multi-threaded high performing features.
- Shipped features reaching more than a Million developers across the planet .
- Delivered extra features during a high-pressure V1 product cycle building Visual studio tooling for Windows Phone 7 resulting in highest rating and promotion.

Application Developer, Oracle India

Jun 2005 - Jan 2008

- Built and shipped features, bug fixes in Oracle HRMS product over 2 release cycles.
- Wrote and optimized 100+ Oracle PL/SQL queries/stored procedures that went into ERP products, finished Java 1.5 certification.

PEER REVIEWED PUBLICATIONS

- "Motion Planner Guided Visuomotor Policy Learning.", **Venkata Pradeep Kadubandi**, Gautam Salhotra, Gaurav Sukhatme, Peter Englert. Accepted for Machine Learning for Motion Planning workshop at ICRA 2021.

PROJECTS

Using Natural Language to augment learning an embedding space for transferable robot skills

- Class project in Deep Learning class at USC. My first project on Deep RL.
- Extending the previous work 'Learning an Embedding space for Transferable Robot skills' by adding a natural language component to guide learning.

Artificial Intelligence for Robotics (Dr. Sebastian Thrun, Udacity)

- Implemented multivariate kalman filters to localize a robot moving in a circular track. Path planning to follow the target and PID control for moving.

Face Detection and Tracking

- Built a face tracker with a webcam sensor to detect and a dynamixel servo to position the camera to align the user's face in the center. Hands-on experience with ROS, cv_bridge, usb_cam.

Data Wrangling and Analysis (Data Science nano degree, Udacity)

- Analyze New York subway Ridership data to infer trends based on weather, time of day, day of week etc. Plotting to visualize the analysis.

EDUCATION

Masters, Computer Science (Intelligent Robotics)

Aug 2018 - Dec 2020

University of Southern California

GPA: 3.97

Bachelor of Technology, Computer Science

Sep 2001 - May 2005

National Institute of Technology Warangal

Percentage: 77.59

SKILLS

Languages: Python, C++, C#, .Net Core, MATLAB

Libraries: Numpy, Pytorch, Tensorflow, Keras, Matplotlib, ggplot, ROS, OpenCV, openai-gym, garage

Fields: Machine Learning, Artificial Intelligence, Robotics, Distributed Systems, deep learning

Sub-Fields: Reinforcement Learning, AutoEncoders, Motion Planning, Optimal Control, Computer Vision, NLP

Tools: Jupyter, Tensorboard, Visdom, MuJoCo, Gazebo, LaTeX, Overleaf

Systems: Azure, Eventhubs / Kafka, MapReduce, Service Fabric, AWS, Kubernetes, Docker

GRADUATE COURSEWORK

- Deep Learning: CNN, RNN, LSTM, GAN, AutoEncoder, VAE network architectures; DQN, TRPO, PPO, Deep RL algorithms.
- Robotics: Probabilistic State Estimation, Localization, (Extended) Kalman Filters, SLAM, Path Planning, Sampling Based Motion Planning (RRT/RRT*), Configuration spaces, Kinematics, Dynamics, and Task Space Regions (TSRs).
- Computer Vision: Traditional Computer Vision methods : Region Segmentation, Image Classification and Detection, Color space, HOG / SIFT features, Structure From Motion, Homography; Deep Learning methods: Various Image Classification architectures (LeNet, VGGNet, AlexNet, InceptionNet, ResNet, EfficientNet), Semantic Segmentation techniques (FCN, DDN, Deep Lab), Object Detection (R-CNN Family, YOLO, SSD, FPN), Instance Segmentation, Activity Recognition.
- Machine Learning: Underlying theory behind classical Machine Learning algorithms. Proofs of Linear/Logistic Regression, SVM and Hidden Markov Models using Lagrangian Duality, Expectation Maximization.
- Autonomous Cyber Physical Systems: Dynamical Systems, Formal methods for safety verification, Temporal and Signal Temporal Logic.
- Coordinated Mobile Robots (Informal Audit of PhD level course): Research literature on configuration spaces, motion planning algorithms, multi robot systems, coverage, behavior based robotics, energy awareness.

ACADEMIC HONORS

- Ranked 2nd in Andhra Pradesh, India (among 100K+ students) and 150 in India wide (among 1 Million students) competitive exams testing Mathematics and Physics.