Dheeraj Rajaram Reddy

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Experience

- **ML Engineer at Swish | The Perfect Shot (theswishapp.io)** — San Francisco
  An app for analyzing and assessing selfies, by taking the target demography into consideration — *Apr 2018 - Present*
  - Worked on the selfie ranking algorithm using autoencoders and convolutional neural networks. Built using **TensorFlow** and **Chainer**.
  - Worked with massive real world image datasets from users of the app. Used **OpenCV**, **NumPy** and **Scikit** for data analysis and preprocessing.
  - The model was deployed on Firebase ML Kit using TensorFlow Lite.
- **Team Leader and Planning Head at Project MANAS (projectmanas.in)** — Manipal
  A multi-disciplinary research group that works in the field of AI Robotics — *May 2017 - Present*
  - Designed and implemented the navigation and planning stack of an autonomous bot in **ROS Kinetic** and **C++**.
  - The bot won 2nd place at the IGVC 2018 Interoperability Profiles Challenge out of 36 competing teams.
  - Designed the architecture and maintaining the codebase for an autonomous car built for Indian roads. Implemented on **ROS2 Bouncy** using **C++** and **Python**. The autonomous car can do navigation in unstructured road highways with Level 2 autonomy.
  - Worked on building occupany grids that can handle **multiple LiDAR sources**, with **CUDA** accelerated kernels for real-time performance.
  - Worked on an **unsupervised** deep neural network for tracking dynamics obstacles using 3D pointclouds. Built using **PyTorch**.
  - Built a deep neural network for traffic sign detection with only **175k trainable parameters**, for use in critical speed intensive situations. Built using **TensorFlow** and **OpenCV**.
  - Implemented various trajectory planners for holonomic, differential-drive and Ackerman drive models in **C++**.
  - Worked on fusing various sources of odometry such as IMU, visual odometry and wheel encoders using linear, extended and unscented **Kalman filters**.
- **Manipal Institute of Technology** — Manipal
  Research and Leadership
  - Research Assistant: Optic disc segmentation, and no reference image quality assessment of fundus images using deep neural networks. Worked with doctors for early detection of macular hole degeneration.
  - General Secretary of ACM Student Chapter: Conducted numerous workshops on machine learning, deep learning and image processing. Worked with scikit, NumPy, OpenCV, matplotlib and TensorFlow.

Education

- **Manipal Institute of Technology** — Manipal
  B.Tech in CSE; CGPA: 8.33/10.0 — *2016 – 2020*
- **Bethany High School** — Bangalore
  10th (ICSE): 89.66%; 12th (ISC): 93.75%

Projects

- **ReiLs**: A reinforcement learning framework with a TensorFlow back-end for faster modular prototyping, deployment and bench-marking of Deep-RL pipelines. Built using **TensorFlow**, **MPI**, **OpenAI Gym**.
- **AzzuNet**: Implemented a bidirectional LSTM for word sense induction and disambiguation task (SemEval2010 Task 8) organized by Philips India. Qualified for the final national round.
- **tfutils**: Utilities designed for TensorFlow that allows for convenient parallelizing of neural network, as well as tools for logging, saving and testing neural networks.
- **WiPay**: Android application to serve as a marketplace for mobile data. Built in 24h hours for AngelHack. 3rd Place.
- **Chess AI**: A chess engine that uses Alpha-Beta pruning. Built in 11th grade. Achieves an ELO rating of 800.

Programming Skills

- **Languages**: C, C++, Java, Python, Haskell, Rust
- **Technologies**: Git, Linux, ROS, ROS2, OpenCV, Tensorflow, PyTorch, Chainer, Gazebo, PCL, ONNX, CUDA

Achievements

- **ACM ICPC Asia Regional Qualifier**: Dec 2017