Daksh Jotwani

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Education

- **Purdue University** West Lafayette, IN
  B.S. Computer Science, B.S. Mathematics *August 2016 - May 2020*
  - GPA: **3.94/4.00**
  - Coursework: Deep Learning, Data Structures, Algorithms, Systems Programming, Linear Algebra

Work Experience

- **Tesla** Palo Alto, CA
  Senior Software Engineer *December 2022 - Present*
  - Consolidated numerous OTA software update and multi-device update management implementations into a single updater service responsible for updating itself (a linux IoT device) and an arbitrary number of children devices.
  - Designed the updater service to be easily portable across platforms and product configurations, such as homes with multiple Powerwalls, Supercharger locations with multiple linux controllers, and industrial sites with over 200 Megapacks and Powerpacks.
  - Brought up additional features on the Powerwall 3 Linux controller such as secure boot, secure key storage, and system software watchdogs to improve the reliabilty and security posture of the product.

- **Tesla** Palo Alto, CA
  Software Engineer *June 2020 - December 2022*
  - Developed a CAN message proxy over Bluetooth Classic to establish real-time comms/controls between vehicles and prototype home/energy products.
  - Built WiFi and cellular modem management capabilities for Powerwall 3 to enable installers and customers to connect their Powerwalls to Tesla's cloud services and mobile app.
  - Responsible for bringing up ARM Trusted Firmware, U-boot, Linux, platform system software (Network management, OTA updaters, telemetry upload, configuration/key storage), and production testers for the IoT Linux controller in the Powerwall 3.
  - Executed on various security initiatives such as automated network switch password management and enabling factory device certificate provisioning stations to store secrets on HSMs to automate secret management across Tesla Energy products and factory software.
  - Developed device side software and infrastructure for Tesla's cloud services to remotely change cellular carriers on Linux devices with an eSIM.
  - Built various Pyspark and Airflow pipelines to analyze fleet data and iterate on various arc detection algorithms for a legacy product.

- **Tesla** Palo Alto, CA
  Software Engineer Intern *September 2019 - December 2019*
  - Built an OTA update mechanism to migrate Megapacks, Powerpacks, and Superchargers from CentOS to Tesla's proprietary Linux-based distribution.
  - Wrote a TLS/websocket client for a FreeRTOS product, called Wall Connector, to integrate with Tesla's remote command and telemetry upload cloud services.

- **Flipkart Myntra** Bangalore, India
  Data Scientist Intern *May 2019 - August 2019*
  - Trained and deployed a face recognition-based authentication service to allow registered Flipkart customers to enter their unmanned stores.

- Prototyped person reidentification (ReID) and human action detection models to automatically generate shopping cart receipts for Flipkart and Myntra's offline stores.

- **Myntra** Bangalore, India
  Software Engineering Intern *May 2018 - August 2018*
  - Applied computer vision techniques to monitor store traffic, analyze age/gender demographics, identify returning customers, and detect visual customer satisfaction.
  - Developed a system where computer vision-based inferences from store cameras are broadcast to store devices to provide personalized services such as product/size recommendations to customers.

Projects and Contributions

- **(Contribution) PyTorch** *June 2019 - July 2019*
  - Built a class-balanced dataset batch sampler (`PKSampler`) and an online triplet mining loss function (`TripletMarginLoss`) for PyTorch's torchvision module to tackle similarity learning problems.
  - Wrote training/evaluation reference scripts to showcase torchvision's similarity learning tools.

- **GTAi: Self Driving Car in GTA 5** *March 2019 - Present*
  - Built a data-collection pipeline to map frames to controller inputs and load them for model training.
  - Modelled a neural network architecture to output controls for a given frame using ResNet50 as a feature extractor, followed by a LSTM to infer temporal information from a sequence of frames.
  - Worked on pre-training the ResNet50 backbone on the COCO dataset using RetinaNet and Focal Loss.

- **PayShare** *May 2018 - September 2018*
  - Developed a web application using React and Firebase to split expenses among a group of people.
  - Applied Tesseract OCR to scan receipts and generate a list of items for users to select and split.

Skills

System Software: Golang, Docker, Networking, OTA Updaters, Embedded Linux, Secure Boot, Secure Key Storage, Application Sandboxing.
Machine Learning: Python, PyTorch, PySpark, Airflow, OpenCV.