Swarup Ghosh

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Work Experience

Software Development Engineer - I
semut.io - Semut Technologies Pte Ltd (May 2021 - Present)

- Responsible for maintaining the metrics stack for the cloud platform that is used to collect, store and query **3+ million metrics** for internal use as well as those collected from user applications
- Implemented a couple of Prometheus exporters for telemetry from multiple distributed system components and deployed efficiently on large-scale setting using concurrent goroutines to process **million API requests**
- Implemented various fixes and improvements to an internal legacy project that is used for **auto scaling** of compute cluster nodes
- Designed and developed backend components for APIs providing certificates, notifications, container images, secrets, metrics, etc. as different micro-services to users on Semut cloud platform
- Responsible for deployment and operations of various **multi-replica** services like HashiCorp Vault, Uber M3DB, Percona XtraDB Cluster, etc.

SDE Intern
semut.io - Semut Technologies Pte Ltd (January - May 2021)

- Refactored the open source SDK toolkit (written in Golang) that is used by services to interact with the Semut cloud platform
- Designed and developed various API endpoints for MySQL as a Service offering on the Semut cloud platform which can be used to incrementally backup/maintain/deploy multi-master MySQL clusters easily
- Implemented MySQL as a Service using Kubernetes operators

Data Science Intern
kaksha.ai - DigiPathshala Pvt Ltd (September - December 2020)

- Responsible for creating an API that could generate student reports identifying their strengths and weaknesses using **SQL based pipelines**
- Worked on applying analytics on structured data at **million scale** to derive actionable **business insights** and drive client-facing interactions
- Participated in product design sprints to help ideate data driven personalisation initiative for an **EdTech** platform

Student Developer (TensorFlow)
Google Summer of Code (June - August 2020)

- Systematic study of data adaptive image augmentation techniques to enhance classification performance of modern CNN architectures
- Worked on **3+ PRs** and a **repository of reusable components** for the TensorFlow ecosystem
- Implemented **RandAugment** and **AutoAugment** using TensorFlow 2 ops
- Developed various image processing functions and a **high-level API** to help construct pipelines that can well support various image data augmentation strategies

Projects

DeepFace (September - October 2019)

- Developed an **tf.keras** based implementation of the popular *DeepFace publication*, no other open source implementations exist so far
- Proposed network architecture by Taigman et al. achieves **97.35%** accuracy on LFW face recognition benchmark
- Model was trained on a publicly available million-scale face recognition dataset with the help of tf.data (**ETL**-based) pipelines and **Cloud TPU** accelerators

Education

MS (Online Masters of Science, Computer Science)

- 2021-2023 (pursuing), The University of Texas at Austin
- Current GPA: -/4.0

BTech (Computer Science and Engineering)

- 2017-2021, GD Goenka University, Gurgaon
- Current CGPA: **9.24**/10.0

Indian School Certificate (Science)

- 2017, Delhi Public School, Newtown, Kolkata
- Aggregate: **86%**

Relevant Coursework

- Stanford Machine Learning (Coursera)
- Artificial Neural Networks
- Basics of Image Processing
- Multivariate Analysis
- Design and Analysis of Algorithms
- Calculus for Engineers
- Software Engineering and Testing Methodologies
- NoSQL Databases
- Google Maps APIs (Udacity)

Technical Skills

- **Areas:** Distributed Systems, Micro Services, Computer Vision, Machine Learning, Open Source, DevOps
- **Languages:** Go, Python, C, JavaScript, Swift, Java, PHP, R
- **Libraries and Frameworks:** Kubernetes, TensorFlow, Keras, Node.js, OpenCV, Scikit-Learn, Flask, Paho
- **Tools:** Git, Docker, Markdown, Prometheus, Google Maps
- **Platforms:** Linux, Google Cloud Platform, Cloud TPUs, Amazon Web Services, Heroku
- **Databases and Storage:** MongoDB, Google Cloud Storage, AWS S3, MySQL, PostgreSQL, M3DB, Ceph

Attendance using Facial Recognition (September 2018 - December 2019)

- Compared various **machine learning** and **deep learning** techniques discussed in face recognition and computer vision literature (implementations using OpenCV, Scikit Learn, Keras)
- Developed a complete **web app** based system for automatic marking of students' attendance
- Constructed a generic face recognition dataset and by applying transfer learning **98%** recognition accuracy could be achieved on the test set

Stock Exchange Simulator (September 2016, April 2017)

- Wrote a programmatic interface from scratch using **CoreGraphics** that could allow plotting on iOS Views (the graphical plotting component could draw **2D mathematical functions** and **line plots**)
- Delivered a production-ready web as well as **iOS app** simulating a basic stock exchange and a portal to simulate market updates
- Was awarded a **Letter of Appreciation** by Delhi Public School, Newtown as the app was used by **10** participating teams at school fest

Virtual Trader (August 2017, August 2018)

- Worked with Christ University, Bangalore to develop a cloud-native (exact iOS-like UI) web app
- **40+** participants used the application to perform virtual trading on an automated stock commodity market developed using **Node.js** and **PHP**

Activities

Workshop on API Development using vanilla Node.js (October 2019)

- Introduced **15+** students (*GD Goenka University Coders Club*) to asynchronous programming and helped them understand how to develop API servers from scratch using **Node.js** http library only

Workshop on Git and Open Source (February 2019)

- Introduced **30+** students (*GD Goenka University Coders Club*) to **Git** VCS and promote awareness about open source technologies

Kharagpur Winter of Code (December 2018)

- Worked on an **OpenStreetMaps** based project aimed at real time disaster relief