Shashank Rangarajan

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Education

- **University of Southern California** — California, USA
  Master of Science - Computer Science (Artificial Intelligence); GPA: 4.0 — *August 2022 - Present*
  Courses: *Machine Learning, Algorithms, Natural Language Processing, Deep Learning*
- **Sri Jayachamarajendra College of Engineering** — Karnataka, India
  Bachelor of Engineering - Computer Science & Engineering; CGPA: 9.75 — *July 2016 - June 2020*
  Courses: *Algorithms, Data Structures, Adv. Math, Operating Systems, Networks, Databases, Data Mining*

Skills Summary

- **Languages**: Python, Java, JavaScript, SQL
- **Frameworks**: PyTorch, Scikit, TensorFlow, Flask, NodeJS, React
- **Platforms**: Linux, AWS, GCP

Work Experience

- **University of Southern California** — California, USA
  Student Researcher/ Developer (Part-time) — *Feb 2023 - Present*
  - **Chemistry Department**: Analysis of X-Ray Diffraction in *He* bubbles using Deep Learning
    - Synthesised diffraction image dataset using analytical equations
    - Developed deep-learning model to estimate - *radius, intensity, aspect-ratio, rotation*
  - **Laboratory of Neuro Imaging**: Data Archive BRAIN Initiative (DABI)
    - Designing the backend system for the (upcoming) DABI-analysis pipeline
- **Amazon.com Inc.** — Karnataka, India
  Software Development Engineer (Full-time) — *June 2020 - July 2022*
  - **Expresso**: An internal MLOps platform built to accelerate experimentation and deployment of ML models
    - Designed ETL support on Expresso, and onboarded 1 production use case.
    - Re-architected legacy Machine Learning Training Platform, and migrated 90+ production models ensuring 100% uptime and performance.
    - Moved production system to federated AWS accounts with 0-data loss and minimal availability impact.
    - Launched and brought in 5 customer teams to Configuration Panel, CLI, and Web UI.
    - Mitigated 100+ security risks, Fixed Sev-2s, across 10+ production pipelines owned by Expresso team.
  - **Leadership**: Mentored 1 intern, and orchestrated development of a peer-review component on Expresso.
- **Motorola Mobility** — Karnataka, India
  Software Development Engineer (Full-time, Contractual) — *Sep 2019 - June 2020*
  - **Over The Air updates (OTA)**: Provides software upgrades for motorola devices world-wide
    - Devised & launched smart updates for Motorola phones making updates seamless for 100K+ devices.
    - Ideated & designed the customer feedback feature into OTA app
  - **Leadership**:
    - Delivered a Game Recommender System for *Hello You* - a motorola app, providing a customized experience for users.
    - Led a team of 2 interns in developing a Log Analyzer for automatic detection of call-drops using system logs, and reduced ticket turn-around time by 30%.

Publications

- K M Anil Kumar, B Ajay, **R, Shashank**, & D A, Amogha Subramanya. (2019). An Apriori Method for Topic Extraction from Text Files. In International Journal of Recent Technology and Engineering (IJRTE) (Vol. 8, Issue 2, pp. 2516–2521). Blue Eyes Intelligence Engineering and Sciences Engineering and Sciences Publication - BEIESP. https://doi.org/10.35940/ijrte.a3068.078219

Projects

- **Forward-Forward: A Comparision of Backprop v/s Forward-Froward (FF) algorithms**: *in progress*
  Contribution: Reproduced results in (Hinton, 2022), and extended FF to convolutional, and self-attention operators. Studied if FF and backprop can be good initializations for each other. [Report | Code]
- **Identifying Deceptive Content: A Study on Clickbait and Fake News Detection**: *in progress*
  Contribution: Reproduced results in (Nakamura et al., 2020), and implemented a modified version of (Kolla, 2019) to see if external data could improve fake news detection in LIAR dataset. Explored fine-grained predictions for clickbait and fake-news by studying the co-relation between the model predictions. [Report | Code]
- **Store Sales: Time Series Forecasting (kaggle competition)**: *Dec 2022*
  Contribution: Performed EDA on the store sales data, along with the implementation of the baseline regression model. Experimented with a bunch of models including - WEKA's SMOreg, Facebook's Prophet, RandomForestRegressor with various features and arrived at one of the best performing models in the leaderboard. [Report | Code]
- **Trojan Detection: Meta Neural Analysis for Trojan Detection (MNTD)**: *Nov 2022*
  Contribution: Implemented the meta neural trojan detection network proposed by Xu et al. (2020) for the trojan detection challenge (link). Beat the baseline model performance using an ensemble model. [Code]

Achievements and Awards

- Top 5 Submission (out of 200+) - Fraud Detection Challenge, Amazon Machine Learning University *Oct 2021*
- **Dept. Rank #3** in Bachelor of Engineering - Computer Science & Engineering *May 2019*
- Winner - Philips Hackabout 2017, Philips Research India *Oct 2017*
- **College Topper** - second year intermediate examination conducted by KSEEB *April 2015*

References

Hinton, G. (2022). The forward-forward algorithm: Some preliminary investigations.

Kolla, M. (2019). Triple branch bert siamese network for fake news classification on liar-plus dataset.

Nakamura, K., Levy, S., and Wang, W. Y. (2020). r/fakeddit: A multimodal benchmark dataset for fake news detection.

Xu, X., Wang, Q., Li, H., Borisov, N., Gunter, C. A., and Li, B. (2020). Detecting ai trojans using meta neural analysis.