

# Shashank Rangarajan

Portfolio: [rshashank13.github.io](https://github.com/rshashank13)

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## EDUCATION

- **University of Southern California** California, USA  
*Master of Science - Computer Science (Artificial Intelligence); GPA: 4.0* Aug 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* Aug 2015 - May 2019  
*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)* Jun 2020 - Jul 2022
  - **Espresso:** An internal MLOps platform built to accelerate experimentation and deployment of ML models
    - \* Designed ETL support on Espresso, 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 Espresso team.
  - **Leadership:** Mentored 1 intern, and orchestrated development of a peer-review component on Espresso.
- **Motorola Mobility** Karnataka, India  
*Software Development Engineer (Full-time, Contractual)* Sep 2019 - Jun 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 Comparison of Backprop v/s Forward-Froward (FF) algorithms:** Apr 2023  
*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:** Apr 2023  
*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

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- 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 *Apr 2015*

## REFERENCES

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- 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.