

Senior Applied Machine-Learning Scientist with 10 years of experience in the industry. Specialised in discriminative and generative modeling problems, delivering metric-focused iterative improvements through fast innovation.

Education

IIT BOMBAY

MTech in Computer Science (ML)

2014 | Mumbai, IN

WB UTECH

BTech in Computer Science

2011 | Kalyani, IN

Technical Experience

DOMAINS

Click-prediction, Selection, Language Models, Personalisation, Diversity

LANGUAGES

C++, Python, Java, SQL

LIBRARIES & TOOLS

PyTorch, ONNX, Huggingface, Keras, Pandas, SkLearn, Matplotlib, SciPy, NumPy, Jupyter, Docker, Kubernetes, Azure Data Factory, Azure Data Lake Storage, Azure Data Lake Analytics, Distributed FS (Cosmos), Map-Reduce, Kafka, BLAS, GDB, Valgrind, Perf, Git, RESTful APIs, OAuth, Conda, Pip, \LaTeX .

Honours

10th-Board Exam: State Rank: 1st

Recipient, Chief Ministers Gold Medal.

Quarterly Excellence Awards:

Q4 2019-2020, Q1 2021-2022

Publications

[1] Danica J. Sutherland, Hsiao-Yu Tung, Heiko Strathmann, Soumyajit De, Aaditya Ramdas, Alexander J. Smola, and Arthur Gretton. Generative models and model criticism via optimized maximum mean discrepancy. In *5th International Conference on Learning Representations, ICLR 2017, Toulon, France, April 24-26, 2017, Conference Track Proceedings*, 2017. Link.

Industry Experience

MICROSOFT | Senior Data & Applied Scientist, Search Advertising R&R

Dec 2018 - Present | Bangalore, IN

ONLINE RANKING

- Introduced online ranking of ad-assets using low-latency click-prediction models utilising language-agnostic statistical signals to **100+ markets across the globe**.
- Improved model by using semantic query-context signals with a **multilingual** encoder for tackling the **cold-start** problem. Addressed signal sparsity in low-volume markets & latency demands for inference through sampling, **knowledge distillation** and **cached-embeddings**. Obtained +0.3-2.0% Δ CTR across markets.

OFFLINE SELECTION

- Ideated & implemented an approach for offline selection utilising rankscore over historical queries. Worked with partner team on globalisation. Explored **sampling strategies** to address the scale of ranking 10B items everyday (+0.1-0.3% Δ CTR).

PERSONALISATION & DIVERSITY

- Defined scope in selection & ranking, chalked out roadmap and tackled engineering challenges, drove the initiative from **proposal to delivery** working with **multiple cross-functional teams** (+0.2% Δ CTR on personalisable slice).
- Sourced user signals from different services across products into homogeneous text features using **in-context learning**. Examined **user-interest clusters** and explored approaches to capture diverse historical interests. **Customised & fine-tuned** an encoder to output lower dimensional embeddings, meeting capacity budgets while maintaining quality (0.065% \rightarrow 0.058% Δ AUC).

CANDIDATE GENERATION

- Increased candidate density (1.5-2.0 \times) globally with zero-shot **offline asset generation** using an instruction-tuned seq2seq model (+0.22% Δ Revenue).
- Working with LLM expanded query, summarised landing page and user profile for **contextualised online asset generation** in zero-shot setting. Exploring S/MLMs for knowledge distillation, preference optimisation with feedback.

ENGINEERING & LEADERSHIP

- Owning the **modeling infra globalisation** initiative, working in an advisory role for ideation & identifying scope across teams, providing hands-on **mentorship** to new joiners, designing utilities automating common tasks for the team.

ORACLE | Senior Software Engineer, Cloud Infrastructure

Jul 2014 – Apr 2016, Sep 2016 – Dec 2018 | Bangalore, IN

- Designed & implemented a majority of the Marketplace REST API.
- Employed batch-processing & application-layer caching to reduce the response times of multi-page GET-calls from **~2 mins to ~10 secs**.

Research Experience

UNIVERSITY COLLEGE LONDON | Research Assistant, [Gatsby Unit](#)

May 2016 – Jul 2016 | London, UK

- Devised a cache-friendly algorithm for non-parametric two-sample tests involving MMD estimator that showed **~300x speed-up** over naïve implementation.
- Proposed & implemented a multi-threaded variant that outperformed competing algorithms, built with state-of-the-art solvers, by **an order of magnitude** [1].

Open Source Experience

SHOGUN ML LIBRARY | [Core Contributor](#) | [94,221 LOC changes](#)

2013, 2014, 2016 | [Google Summer of Code](#)

2016 Co-mentored in designing Shogun's Linear Algebra library.

2014 Designed & developed a framework for kernel-based hypothesis tests. Added a family of feature selection algorithms on this framework.

2013 Implemented an estimator for log-det of large, sparse matrices arising in the log-likelihood computation of high-dimensional Gaussians in real-world datasets.