

Aakash Kumar Nain

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Experience

Emergence.ai

Jan 2024 - Present

Senior Machine Learning Engineer (Research)

Delhi, India

Publications

- **Transformer Layers as Painters**: Published in **AAAI 2025**, this paper investigates the representational space and flow of information in frozen pretrained transformer-based models.
- **The Ungrounded Alignment** Published in **CogSci 2025**, this paper focuses the importance of plasticity, and demonstrates a simple way to encode specific desired innate behaviors in modality-agnostic models.

Image and Text Moderation

- Worked with the **Scratch** team on the image moderation model to filter out NSFW images based on the image's content, including visuals and text. The system processes 60M images/month.
- Developed synthetic data generation pipelines, and helped build the internal infra for training LLMs.

H2O.ai

April 2021 – Oct 2023

Senior Data Scientist

Delhi, India

- **KYC**: Worked with the CBA team, and helped them leverage **Document.ai** for extracting information from KYC acceptable documents in real-time using **Intelligent Document Processing**. This automation helped CBA to process 6000 pages per hour or 0.5M pages per week, reducing the existing operation costs by more than 65%
- **Health Claims Inspection App**: Developed and deployed a deep learning-based solution for detecting fraud in health claims for IFFCO-Tokio. The system reduced operational costs by approximately 30%, and processes more than 2000 documents every day .

Ola Electric Mobility Pvt. Ltd.

July 2018 – March 2021

Research Engineer II

Bangalore, India

- **Advanced Driver Assistance System**: Developed and deployed a vision-based ADAS with a forward collision warning system in **500 OLA cabs** to prevent road accidents in India. The challenge was to develop the solution within a budget of \$200. Built an end-to-end training and deployment platform that includes training object detection and semantic segmentation models, and deploying them to edge devices.

Paralleldots (Artzen Software Labs Pvt. Ltd.)

Jan 2017 – Sep 2017

Data Scientist

Gurgaon, India

- Co-creator of the **Cornea** app, an end-to-end AI powered photo editor app created for Instagram influencers.
- Cornea was shipped with different functionalities like **popularity score**, **alike images**, art transfer and color transfer. With more than 25,000 downloads within the first week, Cornea was featured in [YourStory](#), and [Product Hunt](#)

Projects

Equinox

- Contributed the [Mistral-7B](#) code example.
- Fixed [bugs](#) in the normalization layers that caused instabilities when training LLMs in Equinox.

Keras 3.0 (Core Collaborator)

- One of the first core collaborators in the Keras core [team](#) that implemented the multi-backend Keras.
- [Contributions](#) include implementations for JAX NN ops, merging layers, metrics, loss functions, data adapters, applications, and code examples.

Keras (Contributor)

- Contributed the following **official code examples**: [OCR for captcha images](#), [Handwriting recognition](#) [Image captioning](#), [Denoising Diffusion Models](#), [WGAN-GP](#), and [CycleGAN](#).

TensorFlow (Contributor and Maintainer)

- Maintained and contributed to the TensorFlow-addons package for four years. Contributions include [Focal loss](#), [Cohen's Kappa](#), and [Gelu](#) activation layer.

Diffusion Models from scratch

- First of its kind, an in-depth tutorial series on diffusion models with a deep focus on the underlying mathematics.
- Simple and intuitive implementations provided in Numpy and Keras with **150 Github stars**.

Technical Skills

- **Programming Languages** : Python (Proficient), C/C++(Prior exp.)
- **Machine Learning** : PyTorch, JAX, Keras, Equinox, TensorFlow, XGBoost, Numpy, OpenCV

Education

GGS Indraprastha University

2012 – 2016

Bachelor of Technology in Computer Science

Delhi, India