

PROFESSIONAL EXPERIENCE

Senior Software Engineer

- *Google DeepMind, Mountain View* Nov 2024 – Present
 - Pioneered the application of **Gemini for education**, leading a cross-functional team to launch a novel visual learning experience that **increased student engagement**.
 - Architected and deployed a **scalable multilingual tool-routing system**, improving API success rates and driving **TPU cost savings** across dozens of tools.
 - Designed a multilingual query generator for Google Search, enabling a **Retrieval-Augmented Generation (RAG)** system that **reduced hallucinations** by addressing LLM data freshness.
 - Established best practices for **production model launches**, running live A/B experiments to validate performance and support feature rollouts for **millions of users**.

Software Engineer

- *Google, Mountain View* Dec 2023 – Nov 2024
 - Led development of **scalable reward model pipelines for i18n**, including synthetic SxS data generation, human evaluations, and an efficient Autoeval frameworkboosting Geminis cultural alignment and factual accuracy.
 - **Advanced post-training methods (RLXF, IPO) to reduce multilingual hallucinations**, using improved reward signals to set new quality standards for non-English models and enable safer global deployment.
 - Launched **Gemini Live for internationalization (i18n)**, managing dataset preparation and recipes for SFT and RLHF, and optimizing dataset weighting to maximize conversational model performance.

Research Intern

- *Google Research, Mountain View* June 2023 – Aug 2023
Advisor: Dr. Yifan He and Dr. Jifeng Rao
 - **Bard**: Improved multilingual reward model using RLHF; automated SxS data generation for multiple languages.
 - **Google Assistant**: Boosted semantic parsing accuracy by 10% using retrieval-based prompting with LLMs.

Intern AI in Image Processing

- *Philips Research North America, Cambridge* May 2022 – Aug 2022
Advisor: Dr. Claudia Errico and Dr. Vipul Rai Paikar
 - Developed a weakly supervised model to detect acoustic shadows in ultrasound videos using a student-teacher framework.
 - Integrated shadow detection with object detection to shortlist high-quality frames, **reducing radiologist workload by 85%**.

Research Intern

- *NYU School of Medicine, New York* Feb 2018 – May 2019
Advisor: Prof. José Maria Raya Garcia Del Olmo, Prof. Narges Razavian
 - Built a lightweight U-Net variant for cartilage segmentation in knee MRIs; achieved **state-of-the-art performance exceeding radiologist accuracy**.
 - Developed voxel-level confidence maps via perturbation analysis. [\[github\]](#) [\[report\]](#)
 - Designed a DenseUnet for 102-class brain segmentation and proposed dynamic loss scheduling. [\[arXiv\]](#) [\[github\]](#)

Strategy Analyst

- *Accenture Management Consulting, Bangalore* May 2016 – Aug 2017
 - Built an NLP system to classify business process steps by automation level, resulting in **\$3M savings** for a Fortune 100 client.
 - Conducted process due diligence for a top-tier chemical merger; received client appreciation for execution quality.

PUBLICATIONS AND PRE-PRINTS

* *equal contribution*

1. **Gemini: a family of highly capable multimodal models** [\[ArXiv\]](#)
Gemini Team (including Aakash Kaku). Pre-print
2. **Harnessing Data and Deep Learning for Stroke Rehabilitation** [\[ProQuest\]](#)
Ph.D. Dissertation, New York University, 2024
Aakash Kaku. Developed deep learning and sensor-based methods to objectively quantify rehabilitation dose and optimize stroke recovery interventions.
3. **Quantifying Impairment and Disease Severity Using AI Models Trained on Healthy Subjects** [\[Paper\]](#)
Boyang Yu, Aakash Kaku, Kangning Liu, Avinash Parnandi, Emily Fokas, Anita Venkatesan, Natasha Pandit, Rajesh Ranganath, Heidi Schambra, Carlos Fernandez-Granda. Nature npj Digital Medicine (2023)

4. **Data-Driven Quantitation of Movement Abnormality after Stroke** [[Paper](#)]
Avinash Parnandi*, **Aakash Kaku***, Anita Venkatesan, Natasha Pandit, Emily Forkas, Boyang Yu, Grace Kim, Dawn Nilsen, Carlos Fernandez-Granda, Heidi Schambra. *Journal of Bioengineering, MDPI* (2023)
5. **StrokeRehab: A Benchmark Dataset for Sub-second Action Identification** [[Paper](#)]
Aakash Kaku*, Kangning Liu*, Avinash Parnandi*, Haresh Rengaraj Rajamohan, Kannan Venkataramanan, Anita Venkatesan, Audre Wirtanen, Natasha Pandit, Heidi Schambra, Carlos Fernandez-Granda. *Proc. of the 36th Conference on Neural Information Processing Systems (NeurIPS Dataset and Benchmark Track)*, 2022
6. **Sequence-to-Sequence Modeling for Action Identification at High Temporal Resolution** [[ArXiv](#)]
Aakash Kaku*, Kangning Liu*, Avinash Parnandi*, Haresh Rengaraj Rajamohan, Kannan Venkataramanan, Anita Venkatesan, Audre Wirtanen, Natasha Pandit, Heidi Schambra, Carlos Fernandez-Granda. *Pre-print*
7. **Deep Probability Estimation** [[ArXiv](#)]
Sheng Liu*, **Aakash Kaku***, Weicheng Zhu*, Matan Leibovich*, Sreyas Mohan*, Boyang Yu, Laure Zanna, Narges Razavian, Carlos Fernandez-Granda. *Spotlight at Proc. of the 39th International Conference on Machine Learning (ICML)*, 2022
8. **PrimSeq: a deep learning-based pipeline to quantitate rehabilitation training** [[ArXiv](#)]
Avinash Parnandi*, **Aakash Kaku***, Anita Venkatesan, Audre Wirtanen, Natasha Pandit, Haresh Rengaraj Rajamohan, Kannan Venkataramanan, Dawn Nilsen, Carlos Fernandez-Granda, Heidi Schambra. *Accepted at PLOS Digital Health*, 2022
9. **Intermediate layers matter in momentum contrastive self supervised learning** [[ArXiv](#)]
A. Kaku, S. Upadhyay, N. Razavian. *Proc. of the 35th Conf. on Neural Information Processing Systems (NeurIPS)*, 2021
10. **An artificial intelligence system for predicting the deterioration of COVID-19 patients in the ER** [[ArXiv](#)]
F. E. Shamout*, Y. Shen*, N. Wu*, **A. Kaku***, J. Park*, T. Makino*, S. Jastrzbski, D. Wang, B. Zhang, S. Dogra, M. Cao, N. Razavian, D. Kudlowitz, L. Azour, W. Moore, Y. W. Lui, Y. Aphinyanaphongs, C. Fernandez-Granda, K. J. Geras. *Nature npj Digital Medicine* (2021)
11. **Towards data-driven stroke rehabilitation via wearable sensors and deep learning** [[ArXiv](#)]
Aakash Kaku*, Avinash Parnandi*, Anita Venkatesan, Natasha Pandit, Heidi Schambra, Carlos Fernandez-Granda. *Proceedings of Machine Learning Research (MLHC)*, 2020
12. **Be Like Water: Robustness to Extraneous Variables Via Adaptive Feature Normalization** [[ArXiv](#)]
Aakash Kaku*, Sreyas Mohan*, Avinash Parnandi, Heidi Schambra, Carlos Fernandez-Granda. *Pre-print*
13. **Automatic Knee Segmentation using Diffusion Weighted MRI** [[Paper](#)]
A. Duarte*, C. Hegde*, **A. Kaku***, S. Mohan*, J G. Raya. *Accepted at Medical Imaging Meets NeurIPS, NeurIPS, Vancouver (Canada) 2019*
14. **Scheduling loss functions for optimal training of segmentation models** [[Extended Abstract](#)]
Aakash Kaku*, Chaitra Hegde*, Sohae Chung, Xiuyuan Wang, Yvonne Lui, Narges Razavian. *Accepted at ISMRM ML Workshop in Sept 2018*
15. **DARTS: DenseUnet-based Automatic Rapid Tool for brain Segmentation** [[ArXiv](#)]
Aakash Kaku*, Chaitra Hegde*, Jeffrey Huang, Sohae Chung, Xiuyuan Wang, Matthew Young, Alireza Radmanesh, Yvonne Lui, Narges Razavian. *Pre-print*

EDUCATION

- **New York University - Center for Data Science (Courant) (NYU CDS)** New York City, USA
Ph.D. in Data Science; **CGPA:** 4/4 Sept 2019 - Dec 2023
 - Advisors: Prof. Carlos Fernandez-Granda and Prof. Narges Razavian
 - Key Courses: Communication in the Mathematical Sciences, Independent studies, Research rotation
- **New York University - Center for Data Science (Courant) (NYU CDS)** New York City, USA
Master of Science in Data Science; **CGPA:** 3.95/4 Sept 2017 – May 2019
 - Key Courses: Mathematics of Deep Learning, Inference and Representation Learning, Deep Learning for Medicine, Natural Language Processing and Representation Learning, Machine Learning, Mathematical tools for Data Science, Deep Learning (Yann LeCun), Probability and Statistics, Python Programming for Data Science, Big Data
- **Indian Institute of Management, Bangalore (IIMB)** Bangalore, India
Post Grad. Diploma in Mgmt. (equivalent to MBA); **CGPA:** 3.55/4 (Top 5%) Jun 2014 – Mar 2016
 - Major: **Business Analytics**; Minor: **Finance**
 - Key Courses: Biz. Analytics and Intelligence, Applied Multivariate Data Analysis, Quant. Methods - 1 & 2
- **Institute of Chemical Technology (ICT)** Mumbai, India
Bachelor of Chemical Engineering; **CGPA:** 8.93/10.00 (Top 10%) 2010 – 2014

RESEARCH EXPERIENCE

Human activity recognition in stroke patients using IMU sensor data [ArXiv]

- *NYU Center for Data Science & School of Medicine, New York*

May 2018 – May 2019

Prof. Carlos Fernandez Granda, Prof. Heidi Schambra

- Developed a ResNet-style model with **adaptive normalization and feature embedding**, improving action recognition by **10%** over standard CNNs.
- **Learned patient-agnostic yet action-relevant features**, enhancing model generalization across varying levels of stroke impairment.

Multi-Label Classification & Unsupervised Localization of Thoracic Diseases

- *NYU Center for Data Science, New York*

Dec 2017 – Jan 2018

Independent Research

- Developed a custom ResNet-based CNN for multi-label classification on 1024×1024 chest X-rays, achieving **AUCs of ~ 0.7** .
- Used **Class Activation Maps (CAMs)** and saliency maps for **unsupervised disease localization**.

TEACHING AND GRADING EXPERIENCE

Teaching Assistant

- *Mathematical Tools for Data Science* Spring 2021 for Prof. Carlos Fernandez Granda at NYU
- *Deep Learning for Medicine* Spring 2019 for Prof. Narges Razavian and Prof. Cem Deniz at NYU
- *Quantitative Methods 2* (Sept - Oct 2015) for Prof. Rajlaxmi Murthy at IIM Bangalore

Grader

- *Mathematical Tools for Data Science* Spring 2021 for Prof. Carlos Fernandez Granda at NYU
- *Predictive Modeling with Sports Data* Spring 2021 for Prof. Brett Bernstein and Prof. David F L at NYU
- *Probability and Statistics for Data Science* Fall 2020 for Prof. Carlos Fernandez Granda at NYU
- *Machine Learning* Spring 2019 for Prof. David Rosenberg and Prof. Julia Kempe at NYU

TECHNICAL SKILLS

- **Programming Languages:** Python, C++, R, SQL, MATLAB, Excel VBA
- **Frameworks & Libraries:** PyTorch, TensorFlow, Keras, scikit-learn, Pandas, NumPy, Matplotlib, OpenCV, NLTK, SpaCy, PySpark
- **Specialized:** RLHF, AutoEval, RAG systems, A/B Testing, LLM Fine-Tuning and LLM Post-Training

SERVICE

- Peer reviewer for **NeurIPS** (2019–2025, including Dataset Track 2022–2024), **ICLR** (2022–2023), **ICML** (2022), **American Journal of Neuroradiology**, and workshops such as NeurIPS Machine Learning for Health (2020–2021).
- Mentored high school girls in the **NYU GSTEM Summer Research Program**, supporting STEM education for underrepresented groups, especially girls and minorities.