RITOBRATA GHOSH

Deep Learning Research Engineer

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WORK EXPERIENCE

Akbar Brothers
Deep Learning Research Engineer Consultant

📅 April 2021 – June 2023   ♦ Remote

- Cleaned and wrangled a huge dataset (>60 GB) consisting of images.
- Set up end-to-end Deep Learning training pipeline for single-label image classification.
- Experimented and worked with Deep Learning architectures such as DenseNet, ResNet, EfficientNet
- Used improvement techniques such as image data augmentation, oversampling and undersampling, gradual freezing, discriminative learning rates, ensemble methods, etc.
- Achieved accuracy of >91% in the classification task, where this has never been done before.
- Worked with tabular data of 200k rows involving features to predict numerical data with XGBoost. Achieved 98% accuracy.
- Worked closely with business stakeholders to understand and solve problems.
- Stack: Python, PyTorch, fast.ai, Scikit-Learn, XGBoost, Pandas, Python, Colab Pro.

Okkular.io
Deep Learning Research Consultant

📅 Sep 2021 – Oct 2021   ♦ Remote

- Wrote the patent filing for a novel architecture developed inside the company (filing process ongoing)
- Briefly worked on Active Learning techniques in Computer Vision to automate the training process and improve accuracy and maintenance.
- Stack: Python, PyTorch, fast.ai, AWS SageMaker, AWS S3, Pandas.

Packt
Technical Reviewer

📅 Sep 2022 – Present   ♦ Remote

- Reviewing a book on advanced PyTorch that is being written where the chapter consists of using PyTorch for advanced problem solving like multimodal models, Deep RL, Generative Adversarial Networks, etc. as well as practical problems like training on multiple GPUs, code profiling, etc.

Stanford University
Section Leader (Teaching Assistant) of Code In Place Program

📅 Apr 2021 – June 2021   ♦ Remote

EDUCATION

M.Sc. (Computer Science) - 9.04/10 CGPA
Maulana Abul Kalam Azad University of Technology (formerly WBUT)

📅 October 2021 – July 2023

B.Sc. (Physics, Mathematics, CS) - First Class
University of Calcutta

📅 2017 – 2021

Higher Secondary - 85%
West Bengal Council of Higher Secondary Education

📅 2017

Secondary - 95%
West Bengal Board of Secondary Education

📅 2015

PROJECTS

Learn JAX: From Linear Regression to Neural Networks

- Wrote a full tutorial on how to use the JAX framework for basic Machine Learning tasks. Introduced the functional paradigm for Deep Learning. Won the Google Open Source Software Expert Prize for this project.

CLIP for Satellite Images

- I worked on augmentation methods, and other hyperparameter optimization techniques to increase the overall accuracy of the model.
- Open-Source Deep Learning model that generates captions for satellite imagery. We used transfer-learning to fine-tune OpenAI CLIP for satellite data. Training was done for multiple hours on a TPUv3-8. We used JAX/Flax and PyTorch for this model.

Dall-E Mini (Now Crayion)

- Created the Dall-E Mini text to image model with a team where I worked on the seq2seq part of the coding.
- The project was covered in a New York Times article by Cade Metz.

Functional Connectivity Differences Between ECoG Signals During Motor Movement vs. Motor Imagery

- As the group project of Neuromatch Academy Summer School- Computational Neuroscience track, I worked on this project. When patients with ECoG probes imagines a movement vs. performs the movement is differentiates with the help of Machine Learning.

- Taught introductory Python, Computer Science concepts, problem solving to about 12 students from India, Bangladesh, and the USA in five sessions of 90 minutes each. Students were of various ages and came from diverse backgrounds including students from Fine Arts backgrounds. For many students, it was the first introduction to programming and CS ever. The material was based on the first-half of the Stanford CS106A course.

- Received direct training from Stanford Professors Mehran Sahami, Chris Piech, and Julie Zelenski. Received further training from Stanford-appointed teacher mentors.

AWARDS AND ACHIEVEMENTS

- Winner of Google Open Source Software Expert Prize (June 2022)

- 1st Place in JAX/Flax Deep Learning Community Event Organized by Hugging Face and Google Cloud (July 2021)

- 3rd Place in JAX/Flax Deep Learning Community Event Organized by Hugging Face and Google Cloud (July 2021)

- Best Speaker of Legislative Assembly in District Level in Youth Parliament Competition, awarded by Department of Parliamentary Affairs, Government of West Bengal (December 2015)

- 3rd Place in District Level in West Bengal State Student Youth Science Fair awarded by Department of Youth Services, Government of West Bengal (September 2015)

TECHNICAL SKILLS

- **Subjects**: Machine Learning, Deep Learning, Computer Vision

- **Languages**: Python, C, C++, OCaml (Beginner), LaTeX, Bash, SQL

- **Frameworks**: PyTorch, fast.ai, NumPy, JAX, Keras, Flask, Scikit-learn

- **Devtools**: Linux, Jupyter Notebook, Git, GitHub, AWS Sagemaker, IBM Cloud, Google Cloud Platform, Weights and Biases

PERSONAL SKILLS

- Excellent communication skills- both spoken and written.

- Teaching complicated topics.

- Comfortable Working Independently.

- Ability to learn very fast.

HOBBIES

- Reading books- long novels and informative non-fiction.

- Learning to play music.

- Poetry recitation and voice acting.

Investing in New Eateries in California: A Data Driven Approach

- As my first Data Science project, I used Foursquare API along with NumPy, SciPy, Folium, Pandas, etc. to investigate investing opportunities in real-world.

PUBLICATIONS

- Ghosh, Ritobrata: *Non-Linear Dynamics Through Linear Algebraic Lenses: Attempting to Learn the Trajectories of the Logistic Map with Artificial Neural Networks*, Zenodo, doi: 10.5281/zenodo.7840239

- *TAKING JULIA FOR A TEST DRIVE: My First Encounter With Julia* by Ritobrata Ghosh, Towards Data Science

MOOCS AND CERTIFICATIONS

- Computational Neuroscience, Neuromatch Academy
- Deep Learning Specialization, deeplearning.ai
- Machine Learning, Stanford/Coursera
- IBM Data Science Professional Certificate, IBM/Coursera