Ayan Das

Curriculum Vitae

CONTACT INFORMATION

Room 03-BB-00, Alan Turing Building, CVSSP
University of Surrey, Guildford, England
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RESEARCH INTERESTS

Deep Learning, Machine Learning & Computer Vision

- Diffusion Models – Theory and Applications
- Continuous-time models, Dynamical Systems & their applications
- Vector Graphics synthesis; Intersection of Vision & Graphics

WORK

Senior Deep Learning researcher at MediaTek Research March 2023 - Present
- Member of the Cambridge DL team led by Alberto Bernacchia
- Works on theoretical & applied generative models in computer vision

Internship at MediaTek Research June 2022 - Feb 2023
- Worked on a theoretically novel Diffusion Models formulation

Teaching Assistant (TA) at University of Surrey Jan - May 2022
- Graduate course on Image Processing & Deep Learning (EEEM063)
- Along with instructors Dr Yi-Zhe Song & Dr John Collomosse

EDUCATION

University of Surrey, United Kingdom 2019 - Present
- Ph.D. student at Centre for Vision, Speech and Signal Processing
- Fully funded by iFlyTek Ph.D. Scholarship
- Expected to graduate at end of 2023

Institute of Engineering & Management, Kolkata, India 2013 - 2017
University: Maulana Abul Kalam Azad University of Technology (MAKAUT)
- Department of Electronics & Communication Engineering

RESEARCH EXPERIENCES

2022 TO NOW — **Area of Research: Diffusion Models Theory**
Team Lead: Alberto Bernaccia, Ph.D.
- MediaTek Research, specialized AI unit of the global MediaTek Group
- Work on theoretical analysis, improvement and applications of Diffusion Models

2019 TO NOW — **Area of Research: Sketch analysis with Deep Learning**
Advisor: Dr. Yi-Zhe Song, Ph.D.
- SketchX Lab, a research group focused on sketch analysis
- Co-advisors: Yongxin Yang, Timothy Hospedales (University of Edinburgh)

2018 TO 2019 — **Area of Research: Medical Imaging with Deep Learning**
Advisor: Dr. Debdoot Sheet, Ph.D.
- Indian Institute of Technology Kharagpur, India
- Member of "Kharagpur Learning, Imaging and Visualization (KLIV)"

2015 TO 2016 — **Area of Research: Evolutionary Computations & Machine Learning**
Advisor: Dr. Swagatam Das, Ph.D.
- Electronics and Communication Sciences Unit
- Indian Statistical Institute, Kolkata, India

2014 TO 2015 — **Area of Research: Handwritten Text/Document Recognition**
Advisor: Prof. Partha Pratim Roy, Ph.D.
- Dept. of Computer Science.
- Indian Institute of Technology, Roorkee, India.

Projects
(Github Profile)

- A personal website (https://ayandas.me/) written in Jekyll & Liquid
- Blogs/Articles (https://ayandas.me/blogs.html) on wide range of research topics
- Worked in project "MIRIAD" funded by Intel India Pvt. Ltd.
- AI conference templates in Typst, a new typesetting system.
- rlx: A Modualr Reinforcement Learning (RL) library for research.

Selected Publications
(Google Scholar)

1. "Score Normalization for a Faster Diffusion Exponential Integrator Sampler", G. Xia, D. Danier, **A. Das**, S. Fotiadis, F. Nabiei, U. Sengupta, A. Bernaccia, Neural Information Processing System (NeurIPS) Diffusion Workshop, 2023.

2. "Image generation with shortest path diffusion", **A. Das***, S. Fotiadis*, A. Batra, F. Nabiei, F. Liao, S. Vakili, DS. Shiu, A. Bernaccia, International Conference on Machine Learning (ICML), 2023. (*Equal Contribution)

3. "ChiroDiff: Modelling chirographic data with Diffusion Models", **A. Das**, Y. Yang, T. Hospedales, T. Xiang, Y. Song, International Conference on Learning Representations (ICLR), 2023.

4. "SketchODE: Learning neural sketch representation in continuous time", **A. Das**, Y. Yang, T. Hospedales, T. Xiang, Y. Song, International Conference on Learning Representations (ICLR), 2022.

5. "Cloud2Curve: Generation and Vectorization of Parametric Sketches", **A. Das**, Y. Yang, T. Hospedales, T. Xiang, Y. Song, Computer Vision and Pattern Recognition (CVPR) 2021.

6. "Pixelor: A Competitive Sketching AI Agent. So you think you can sketch?", A. K. Bhunia*, **A. Das***, U. Muhammad*, Y. Yang, T. Hospedales, T. Xiang, Y. Gryaditskaya, Y. Song, SIGGRAPH Asia 2020. (*Equal Contribution)

7. "BézierSketch: A generative model for scalable vector sketches", **A. Das**, Y. Yang, T. Hospedales, T. Xiang, Y. Song, European Conference on Computer Vision (ECCV) 2020.

8. "Feature Weighting and Selection with a Pareto-optimal Trade-off between Relevancy and Redundancy", **A. Das**, S. Das, Pattern Recognition Letters (PRL) Elsevier.

Please visit my Google Scholar profile for full list of publications.

Professional & Voluntary work

- Serving as reviewer for top conferences (NeurIPS, ICLR, CVPR, ICCV, ECCV, BMVC, ACM SIGGRAPH, SIGGRAPH Asia) and journals (T-PAMI, Elsevier NN, TMLR).
- Recognized as a "Top Reviewer" (i.e. top 10% of reviewers) at NeurIPS 2023.
- Supervised two MSc student projects (one was nominated for best project prize).
- Intel Student Ambassador (Asia Pacific & Japan) for Artificial Intelligence (A.I.)
- Delivered talks at University of Manchester (UK), B.U.P.T (China), Analytics Vidhya etc. Majority of my decks are available here.

Technical Skills

- Programming Languages: C/C++, Python, Julia, Matlab
- ML/DL framework: PyTorch (Highly proficient), Tensorflow
- Math: Linear Algebra, Statistic, Probability, Calculus
- HPC: Cluster management, MPI, Distributed Deep Learning
- Web: Basics of front-end, back-end, Flask, REST APIs
- Miscellaneous: Linux, LaTeX, Version control, CUDA Programming