Deep Chakraborty

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deepc94.github.io

Education

University of Massachusetts Amherst — Amherst, MA
Ph.D. and M.S. in Computer Science — Sep 2017 – May 2026

- **Dissertation:** Information-Theoretic Methods for Understanding and Improving Representations in Neural Networks, advised by Erik Learned-Miller
- **Courses:** Computer Vision, Deep Learning, Advanced Machine Learning, Probabilistic Graphical Models, Distributed Systems, Software Engineering, Advanced Algorithms, Advanced Natural Language Processing

Manipal University — Manipal, India
B.Tech. in Electronics and Communication Engineering — Jul 2012 – Jul 2016

Professional Experience

Apple — Sunnyvale, CA
Machine Learning Research Intern, Video Computer Vision — Jun – Sep 2021, 2020

- Summer 2021: Neural architecture search, advised by Pengsheng Guo
- Summer 2020: Object detection and scene graph generation, advised by Angela Blechschmidt

Signify (*formerly* Philips Lighting) — Cambridge, MA
Research and Development Intern, Speech Processing and Deep Learning — May 2018 – Aug 2018

- Speech emotion recognition and emotion conversion using nonparallel data, advised by Olaitan Olaleye

Academic Experience

University of Massachusetts Amherst — Amherst, MA
Research and Teaching Assistant — Jan 2018 – Present

- Computer Vision lab: Self-supervised learning for improving classification, object detection, and tracking
- Remote Hyperspectral Observers group: Self-supervised learning for categorization of Martian terrain
- Information Fusion lab: Deep saliency maps for improving pedestrian detection in thermal images
- Teaching assistant: Graduate and undergraduate Machine Learning and AI courses (CS 383, 389, 589, 689)

Indian Institute of Technology Mandi — Mandi, India
Research Intern — May 2015 – Jun 2016

- Multimedia Analytics and Systems lab: Dynamic kernel SVMs for birdsong recognition, advised by Dileep A.D.

Publications

[* = equal contribution] See full list and citations at scholar.google.com/Ld6-470AAAAJ

[1] **Improving Pre-Trained Self-Supervised Embeddings Through Effective Entropy Maximization**
D. Chakraborty, Y. LeCun, T.G.J. Rudner, E. Learned-Miller
International Conference on Artificial Intelligence and Statistics (AISTATS), 2025

[2] **Self-Supervised Learning to guide Scientifically Relevant Categorization of Martian Terrain Images**
T. Panambur*, **D. Chakraborty***, M. Meyer, R. Milliken, E. Learned-Miller, M. Parente
Computer Vision and Pattern Recognition Workshops (CVPRW), 2022 (Oral)

[3] **Nonparallel Emotional Speech Conversion**
J. Gao, **D. Chakraborty**, H. Tembine and O. Olaleye
Annual Conference of the International Speech Communication Association (INTERSPEECH), 2019 (Oral)

[4] **Pedestrian Detection in Thermal Images using Saliency Maps**
D. Ghose*, S.M. Desai*, S. Bhattacharya*, **D. Chakraborty***, M. Fiterau, T. Rahman
Computer Vision and Pattern Recognition Workshops (CVPRW), 2019 (Spotlight)

[5] **Unsupervised Hard Example Mining from Videos for Object Detection**
S. Jin*, A. Roy Chowdhury*, H. Jiang, A. Singh, A. Prasad, **D. Chakraborty**, E. Learned-Miller
European Conference on Computer Vision (ECCV), 2018

Projects

See full list of projects on github.com/deepc94

- **Probing Comparative Reasoning Abilities of Vision-Language Models** (Hugging Face) Spring 2023

  Created a dataset of images containing objects described using comparative adjectives, and assessed the ability of VLMs to retrieve the correct image from a given pair. Identified a 40% gap in performance compared to humans.

- **Probabilistic Human Activity Forecasting in the wild** (PyTorch, Pandas, Scikit-learn) Fall 2019

  Implemented a gated recurrent neural network with time interval and masking vectors to forecast human activity from irregularly sampled time series sensor data with missing values. Improved F1-score by 11% compared to baseline on test data from unseen users.

- **Sentiment Style Transfer in Text** (PyTorch, NumPy) Fall 2018

  Implemented a sequence-to-sequence RNN to convert negative reviews to positive reviews using unpaired training data. Enhanced sentiment classification accuracy from 63% to 72% by leveraging weak supervision from noisy data pairs.

Skills and Languages

- **Programming Languages:** Python, C++, Matlab, Bash Script, LaTeX
- **Tools and Frameworks:** PyTorch, TensorFlow, Hugging Face, NumPy, Git, AWS, SLURM, Linux

Scholarships and Awards

- **Outstanding reviewer at ICCV 2025**, top-2.6% of 12,171 reviewers Oct 2025
- **CICS dissertation writing fellowship**, UMass Amherst Dec 2023
- **Riseman and Hanson scholarship**, UMass Amherst Jun 2020
- **Outstanding achiever honorable mention**, Manipal University Dec 2015

Professional and Other Activities

- **Reviewer for machine learning and computer vision conferences** Mar 2022—
  Reviewing for top conferences such as ICCV, ECCV, ICLR, NeurIPS
- **Guest speaker at Energizing Mentoring and Broadening Exposure to Research (EMBER)** Apr 2021
  Delivered a talk on graduate school applications during the EMBER program, aimed at making research accessible to underrepresented groups in computing.
- **Mentor at Girls Inc. Eureka!** Jul 2019
  Served as a mentor in workshop on creative programming with LEDs to motivate high school girls to pursue post-secondary education and careers in STEM fields.