Sankha Subhra Mullick

Website: `https://sankhasubhra.github.io`   Email: mullicksankhasubhra@gmail.com
DBLP: `https://dblp.org/pers/hd/m/Mullick:Sankha_Subhra`   Mobile: +91 9088 087 929

Education:

- **Ph.D. in Computer Science, Indian Statistical Institute, India: 2014-January, 2021**
  Thesis Title: On class imbalance learning: design of non-parametric classifiers, efficient performance indices, and deep oversampling strategies. *Supervisor:* Dr. Swagatam Das.
- **M.Tech in Computer Science, Indian Statistical Institute, Kolkata, India: 2012-2014**
- **B.Tech in Computer Science & Engineering, West Bengal University of Technology, India: 2008-2012**

Research Experience (GitHub: `https://github.com/SankhaSubhra`):

Broad areas of Expertise: Machine Learning, Deep Learning, Evolutionary Optimization

- **Applied Research Engineer, LinkedIn, India, April, 2021-Now**
  - Involved in research on natural language processing and tasked with designing deep text classifiers for maintaining the content quality in the platform.

- **Visiting Scientist, Indian Statistical Institute, Kolkata, January, 2021-March, 2021**
  - Improved performance of meta learning algorithms and investigated their applicability in domain adaptation task.
  - Designed deep classifiers for diagnosing respiratory diseases from chest radiography images keeping the impact of class imbalance in mind.
  - Performed black-box universal as well as image dependent adversarial attacks of varying sparsity on state-of-the-art deep classifiers using evolutionary optimization.

- **Senior Research Fellow, Indian Statistical Institute: 2016-2021**
  - Proposed adversarially learned generative network based artificial oversampling for handling class imbalance in deep image classifiers and achieved about 8% improvement over the state-of-the-arts on average.
  - Designed a couple of scalable self-adaptive variants of k-nearest neighbor type classifiers which offer improved performance as well as higher immunity against class imbalance.
  - Investigated the applicability of popular classification performance evaluation measures in presence of class imbalance especially for challenging applications involving concept drift or streaming data.
  - Formally defined the problem of label ambiguity and showed how that can be handled by a neural network.

- **Junior Research Fellow, Indian Statistical Institute: 2014-2016**
  - Proposed a couple of variants of Differential Evolution (DE) suitable for high dimensional optimization problems. Explored the applicability of DE in problems related to classical machine and deep learning.

Selected Publications (Google Scholar: `https://scholar.google.com/citations?user=QnzlBI8AAAAJ`):

- **Mullick, Sankha Subhra**, Shounak Datta, Sourish Gunesh Dhekane, and Swagatam Das. "Appropriateness of Performance Indices for Imbalanced Data Classification: An Analysis." Pattern Recognition 102 (2020).
- **Mullick, Sankha Subhra**, Shounak Datta and Swagatam Das. "Generative adversarial minority oversampling." in proceedings of the International Conference on Computer Vision (ICCV), 2019.
- **Mullick, Sankha Subhra**, Shounak Datta and Swagatam Das. "Adaptive learning-based k-nearest neighbor classifiers with resilience to class imbalance," IEEE Transactions on Neural Networks and Learning Systems, 29(11) (2018): 5713 - 5725.
- Biswas, Nimagna, Saurajit Chakraborty, **Sankha Subhra Mullick**, and Swagatam Das. "A parameter independent fuzzy weighted k-Nearest neighbor classifier." Pattern Recognition Letters 101 (2017): 80-87.
- Datta, Shounak, **Sankha Subhra Mullick**, and Swagatam Das. "Generalized mean based back-propagation of errors for ambiguity resolution." Pattern Recognition Letters 94 (2017): 22-29.
- Das, Swagatam, **Sankha Subhra Mullick**, and Ponnuthurai N. Suganthan. "Recent advances in differential evolution–an updated survey." Swarm and Evolutionary Computation 27 (2016): 1-30.

Programming Languages:

Regularly use: Python (2+ years), PyTorch (1+ years), Keras/TensorFlow (2+ years), MatLab (7+ years).
Also familiar with: C, C++, R, and shell scripting.

Academic Achievements and Professional Activities:

- Published a total of 9 research articles with citation count of more than 1000, h-index of 7 and i-10 index 7.
- Received ACM-India/IARCS conference travel grant. Selected as a student volunteer at ICCV 2019. Receives Indian Statistical Institute fellowship.
- *Teaching Assistant*: "Pattern Recognition and Image Processing", M.Tech. in Computer Science, ISI, Fall, 2020.
- *Supervised:* 10+ undergraduate and graduate research interns from various notable academic institutes (such as ISI, IIT Delhi, Jadavpur University, IIT Guwahati, IIIT Guwahati, etc.) on projects leading to journal papers, technical reports and/or dissertations since 2015.
- Assisted Dr. Swagatam Das (Ph.D. supervisor) with the drafting of the successful grant applications: NVIDIA (2018) and Department of Science and Technology, Government of India (2020).