Mainak Pal

Junior Year Undergraduate · Jadavpur University

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Education

Jadavpur University — *West Bengal, India*

Bachelor of Engineering in Electronics and Telecommunication — *July. 2017 - PRESENT*

- CGPA : 8.49 (till 3rd year - 1st Sem)

Mahesh Sri Ramkrishna Ashram Vidyalaya(H.S) — *West Bengal, India*

Higher Secondary Education — *2015 - 2017*

- Percentage Score – 89.4

Mahesh Sri Ramkrishna Ashram Vidyalaya(H.S) — *West Bengal, India*

Secondary Education — *2006 - 2015*

- Percentage Score – 92.6

Publications

A Generative Model Based Approach for Zero-shot Breast Cancer Segmentation Explaining Pixels' Contribution to the Model's Prediction,

[Expected Publication] Abstract accepted for publication as a book chapter at Interpretable Artificial Intelligence - A Perspective of Granular Computing, Springer-Verlag — *Apr. 2020*

- Preeti Mukherjee, Mainak Pal, Lidia Ghosh, Amit Konar

Generative Model-driven Structure Aligning Discriminative Embeddings for Transductive Zero-shot Learning,

[Expected Publication] Under review at Journal of Visual Communication and Image Representation, ELSEVIER [PREPRINT] — *Aug. 2019*

- Omkar Gune, Mainak Pal, Preeti Mukherjee, Biplab Banerjee, Subhasis Chaudhuri

Multi-resolution Hierarchical Clustering by Vector Quantization — *Goa, India*

Accepted at International Conference on Cybernetics, Cognition and Machine Learning Applications(ICCCMLA 2019), Advances in Cybernetics, Cognition, and Machine Learning for Communication Technologies pp 243-249 [PAPER] — *Aug. 2019*

- Mainak Pal, Preeti Mukherjee, Amit Konar

JU_ETCE_17_21 at SemEval-2019 Task 6: Efficient Machine Learning and Neural Network Approaches for Identifying and Categorizing Offensive Language in Tweets — *Minneapolis, Minnesota, USA*

Proceedings of the 13th International Workshop on Semantic Evaluation (SemEval-2019), pages 662–667 [PAPER] — *Jun. 2019*

- Preeti Mukherjee, Mainak Pal, Somnath Banerjee, Sudip Kumar Naskar

Experience

Serre Lab, Brown University — *RI, USA*

Summer Research Intern Under Dr. Thomas Serre — *May 2020 - PRESENT*

- Computational Vision, Neuroscience

Xu Lab, Carnegie Mellon University

Remote Research Intern Under Dr. Min Xu — *Jan 2020 - PRESENT*

- Computational Biology, Computer Vision

Vision and Image Processing Lab, IIT Bombay *Mumbai, India*

Summer Research Intern Under Dr. Biplab Banerjee *May 2019 - July 2019*

- Transductive Zero-shot Learning, Computer Vision

Artificial Intelligence Laboratory, ETCE Department, Jadavpur University *West Bengal, India*

Undergraduate Research Assistant Under Dr. Amit Konar *Apr 2019 - PRESENT*

- Machine Learning, Pattern Recognition, Cognitive Science

NLP Lab, CSE Department, Jadavpur University *West Bengal, India*

Undergraduate Research Assistant Under Dr. Sudip Kumar Naskar *Aug 2018 - Jun 2019*

- Natural Language Processing, Machine Translation

Projects

Automatic behavioral analysis of C.Elegans locomotion *May. 2020 - PRESENT*

Summer Internship Under Dr. Thomas Serre, Serre Lab, Brown University

- Working on various recurrent neural models to automate behavioral analysis of C.Elegans locomotion.

Computational Vision in Cryo-electron Tomography *Jan. 2020 - PRESENT*

Remote Internship Under Dr.Min Xu, Xu Lab, Carnegie Mellon University

- Exploring various methods to extract information from tomographic data

Generative adversarial approach for unsupervised domain adaptation *Nov. 2019 - PRESENT*

Remotely working Under Dr. Biplab Banerjee, VIP Lab, IIT Bombay

- Extending our previous work on ZSL in unsupervised domain adaptation. Working on various generative models to achieve better latent layer representation of multimodal visual feature space.

Zero-shot breast cancer segmentation *Nov. 2019 - Mar. 2020*

Undergraduate Research Project Under Dr. Amit Konar,JU ETCE

- Trained the BiGan model on healthy data so that the trained model can construct nearest healthy samples from unhealthy data.
- Based on RISE model, we proposed a novel architecture for automatic segmentation of the tumor region from our previous understandings.
- Our approach is capable of segmenting tumors without using any unhealthy samples while training.

Transductive Zero-shot Learning *May. 2019 - Jul. 2019*

Summer Internship Under Dr. Biplab Banerjee, VIP Lab, IIT Bombay

- Worked on the Transductive extension of Structure Aligning Discriminative Latent Embedding for Zero-Shot Learning.
- Exploring zero-shot application on various domains.
- Exploring implementation of various autoencoders on latent space and semantic space.

Vector Quantization Clustering *Mar. 2019 - Feb 20 2019*

Undergraduate Research Project Under Dr. Amit Konar,JU ETCE

- In existing clustering algorithms, larger attributes have more contribution in the distance measure in comparison to the attributes of small values. Thus, attributes of smaller values even if differ by larger magnitude are not encountered in the clustering algorithms - causing false clustering.
- To overcome this problem, we have proposed an novel clustering algorithm based on quantization at each attribte level.
- Our approach performs better than state-of-arts and also computationally less expensive. We have worked on several gene-micro array datasets, breast cancer dataset. Proposed method is also helpful in time-series modeling.

Identifying and Categorizing Offensive Language in Social Media *Sep. 2018 - Feb. 2019*

Undergraduate Research Project Under Dr. Sudip Kumar Naskar,JU CSE

- Sentiment analysis on a set of tweets .
- Explored multiprocessing.
- Explored different techniques of machine learning (like Logistic Regression , Linear SVC , LinearSVC with L1-based feature selection , Multinomial NB , Bernoulli NB etc.)
- Implemented several Deep Learning networks like CNN-word2vec , attention based Bi - RNN with LSTM

Perro Gato : An Image Classifier

Sep. 2018 - Feb. 2019

Independent Research Project [CODE]

- An image classifier that uses deep learning to detect if it is a ”cat” image or a ”dog” image.
- Implemented Convolution Neural Network.

Real-time 2D plot of Azimuth Plane using Ultrasonic Wave Sensor (HC SR04)

May. 2018 - June. 2018

Independent Summer Research Project [CODE] [DEMO]

- Deployed a 2D space scanner using Ultrasonic Wave Sensor(HC SR04) in Arduino Ide and plotted output vs. Azimuth angular positions using Processing.
- Future aspects :-In the area of 3D reconstruction,latency improvement and computer vision.

Approximate-Pi

Apr. 2018

Independent Research Project [CODE] [DEMO]

- Approximated the value of pi using Processing.

Other Projects

Independent Projects

- Cloud : A nodejs app deployed on Heroku aiming to help beginners finding Open Source projects. [CODE] [DEMO]
- [Py]Scanner : A real-time Document Scanner application using OpenCV written in python. [CODE]
- Mosom : A weather forecast app built in PyQt. [CODE]
- Shoot The Ball : A game developed using Processing and implemented the idea of processing.js. [CODE]

Skill-sets

Programming Languages , Python,C,C++,Matlab,Julia

Machine Learning and Deep Learning Techniques , Generalized Linear Models, Regularization Techniques, Decision Trees, Ensemble Models (Gra- dient Boosting, Random Forest, Voting Classi□ers, etc), Convolution Neural Networks,Recurrent Neural Network, Clustering and Dimension Reduction

Data Science and Numerical Computation Libraries , Numpy, Scikit-Learn,Pandas, Matplotlib,Scypi,Gensim

Deep Learning Libraries , Pytorch, Keras, Tensorflow

Operating Systems, Linux, Windows

Version Control, Git and Github

Typesetting Tools, Latex, Markdown

Languages, English (Professional Working Proficiency), Bengali (Native), Hindi (Professional Working Proficiency)

Responsibilities

IEEE Computer Society Student’s Branch Chapter, Jadavpur University

Jadavpur University

Founder and Chairperson

Mar. 2019 - PRESENT

- The Computer Society of the JU, IEEE student branch aims to to be a leading provider of technical information, community services, and personalized services to the world’s computer professionals. It is our goal to integrate our activities beyond the realms of competitive coding into the broader aspects of Computer Science.

IEEE Jadavpur University Student’s Branch

Jadavpur University

Webmaster

Feb. 2019 - PRESENT

- The Jadavpur University IEEE student branch, founded in 2010, belongs to the Kolkata section of Region 10 of the organization.
- Developed the homepage. [HOMEPAGE]

Extracurricular Activity

Think.AI : The IEEE Machine Learning Summit’19

Apr. 2019

Head Coordinator

- Two day workshop on Machine Learning organised by IEEE CS, Jadavpur University.
- Developed the homepage for aforesaid event. [HOMEPAGE]

Fantasy for Innovation (Srijan'19)

Feb. 2019

Executive Committee Member

- Events organised by IEEE Student's Branch, JU at Srijan'19 (Techno Management Fest of Jadavpur University)

Electrophoria'18(Departmental Freshers')

Oct. 2018 - Nov. 2018

Core Member of Web Development Team

- Developed the homepage for aforesaid event. [HOMEPAGE] [GITHUB]

Jadavpur University Code Club

Sep. 2017 - PRESENT

Member

- A club aims to promote an atmosphere of competitive programming among fellow students of Jadavpur University.

Boeing National Aeromodeling Workshop IIT Kanpur, Kanpur

Nov. 2017

Workshop participant

- Two day workshop on making an RC aeroplane.

Painting

5th year distinction holder in Applied Fine Arts at Academy of Fine Arts

- Extreamly interested in classical fine arts. Love to draw with pencil and charcoal.

Fields of Interest

Machine Learning & Deep Learning, Studying, implementing the results of deep learning research papers and experimenting for improving accuracy or training time.
Cognitive Science & Computational Vision, Exploring neural computation done by Visual cortex. Developing computational models of vision connecting cognitive science and visual perception.
Natural Language Processing, Experimenting with modifications in existing neural models that can improve accuracy. Passionate about working with cross lingual information retrieval and developing technologies for Indian languages.

Referees

Dr. Biplab Banerjee,
Assistant Professor Centre of Studies in Resources Engineering (CSRE),IIT Bombay
getbiplab@gmail.com
Dr. Amit Konar,
Professor Electronics and Telecommunication Engineering, Jadavpur University,
konaramit@yahoo.co.in
Dr. Sudip Kumar Naskar,
Assistant Professor Computer Science and Engineering, Jadavpur University,
sudip.naskar@gmail.com