Sanchayan Sarkar

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Experience

***Graduate Student Researcher*, University of Pittsburgh,** Pittsburgh, PA, USA. Aug 2018-Present

Research assistant in developing multimodal machine learning models and analyzing behavior in dyadic conversations.

Project: Multimodal Turn Taking in Dyadic Conversations July 2020- Present

- Developed multimodal machine learning models (in Python, PyTorch) for learning turn-taking strategies (end-of-turns, silence duration) from audio-video-text sequences in dyadic interactions.
- Achieved statistically significant multimodal cues and used multimodal transformers to obtain higher performance.

Project: Automatic Emotion Recognition in Dyadic Conversations May 2020- Present

- Developed context aware multimodal sequential and non-sequential neural models (LSTM, Conv-LSTM, Transformers) for predicting composite emotion constructs from audio-video-text sequences in dyads (using Python, PyTorch).

Project: Automatic Depression Detection in Mother-Child Dyads Aug 2018- Apr 2020

- Developed jointly learned Siamese neural networks for predicting PHQ-9 scores of depressed mothers in from mother-child face to face conversations (using Python, PyTorch).

***Project Researcher*, Indian Statistical Institute,** Kolkata, West Bengal, India. Nov 2015- Dec 2016

Research Intern working on developing mathematical and statistical models for human face recognition.

Project: Illumination Variation Problem on Human Face Recognition

- Developed novel local illumination-invariant feature for face recognition beating competitive methods with accuracy of 6.7% on CMU-PIE, 5% on Yale B and 2% AR, CUHK dataset • Technologies: MATLAB. [Paper]

Project: Dimension Reduction and Noise Reduction for Face Recognition

- Used linear regression to stabilize lower entropy space for dimension reduction in face recognition. • Achieved 3% improvement on FRAV-2D, FERET dataset. • Technologies: MATLAB [Details]

Skills & Interests

Programming Languages: Python, MATLAB, Java, C/C++, SQL, Javascript.
Tools: PyTorch, Keras, TensorFlow, scikit-learn, openCV, pandas, Caffe, git, Arduino IDE, Android SDK, Unity 3D
Research Interests: Deep Learning, Machine Learning, Natural Language Processing, Computer Vision.

Education

Master of Science (MS), University of Pittsburgh, PA, USA Aug 2017- Present

- Computer Science with specialization and research experience in Machine Learning. | *CGPA: 3.55 / 4.0*
- *Courses:* Machine Learning, Deep Learning, Natural Language Processing, Computer Vision, Artificial Intelligence.

Master of Science, (MSc) University of Calcutta, India Jul 2013- Jun2015

- Computer and Information Science. | *First Class, 75 % (in top 5)*
- *Thesis*: Image Enhancement using Cuckoo-Search Optimization.

Bachelor of Science, (BSc), St. Xavier's College, Kolkata, India Jul 2010- Jun 2013

- Computer Science (Honors). | *First Class, 76% (in top 10)*

Selected Academic Projects

Detecting Deep Fakes (11785 Deep Learning). Nov 2019- Dec 2019

- Developed Siamese Statistical Recurrent Neural Networks to detect deep-fake video sequence (using Python, Pytorch)
- Achieved 10% higher performance over Statistical Recurrent Networks in FaceForensics++ dataset. [Details]

Detecting Pneumonia in Chest X-Ray Images: ML approaches (2750 ML) Mar 2019 – Apr 2019

- Implemented Resnet-50, InceptionNet, CNN on Chest X-ray images (using Keras, Tensorflow) with a 3% increase in recall with Resnet-50 over InceptionNet. [Details]

Tiny Google –A parallel word search engine (2510 OS) Nov 2018- Dec 2018

- Developed a distributed search engine, using multithreading, that searches and retrieves documents based on search words from multiple worker nodes. Project done using Python and Threading. [Details]

Direct Manipulation in Virtual Reality (2610 HCI). Nov 2017- Dec 2017

- Used tracked movements from smartwatch to move objects in Virtual Reality (using Android SDK, Unity 3D).
- Set up an user study gauging the difficulty of moving an box to a sphere of varying length in the virtual environment. [Details]

Publications

- ***"Leaning Turn-Taking Strategies in Multimodal Dialogue", 2021.*** (under preparation).
- ***"Local Centre of Mass Face For Face Recognition under varying Illumination", 2017.*** *[Link]*
- ***"Challenges and Effects of Plastic Surgery on Face Recognition Performance: A review", 2016.*** *[Link]*