SWATI

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EXPERIENCE & EDUCATION

Researcher, TCS Innovation Labs, New Delhi *July 2016 - Present*
Research Interest: Deep Learning and its applications in Computer Vision

Master of Technology in Communications and Signal Processing *July 2014 - June 2016*
Department of Electrical Engineering Overall GPA: 9.03/10
Indian Institute of Technology (IIT) Hyderabad

Bachelors of Engineering in Electronics and Communications *July 2010 - June 2014*
Department of Electrical Engineering Overall GPA: 8.67/10
University Institute of Engineering and Technology, Panjab University, Chandigarh

PUBLICATIONS

- G. Gupta, ***Swati***, M. Sharma, Lovekesh Vig, *Information Extraction from Hand-marked Industrial Inspection Sheets*, CBDAR workshop, ICDAR, 2017 (Accepted).
- ***Swati***, G. Gupta, M. Yadav, M. Sharma, Lovekesh Vig, *Siamese Networks For Chromosome Classification*, Bio-Image Computing workshop, ICCV, 2017 (under review).

RESEARCH PROJECTS

Automatic Karyotyping of Chromosomes in Cell Images August 2016 - Present
Advisors: Dr. Lovekesh and Dr. Gautam Shroff, TCS Innovation Labs

- Karyotyping of chromosomes in cell images requires considerable amount of effort and time of doctors. Therefore, we attempt to automate Karyotyping using Crowdsourcing and Deep Learning methods.
- Considering the domain criticality, we employ crowd to segment chromosomes in cell images. However, the intricate and costly involvement of crowd drive us to explore deep learning in the low data regime.
- We utilize siamese networks trained to learn pairwise similarity. Further, we ameliorate their training using several methods to select dissimilar pairs, and also using an ensemble of such networks.

Information extraction from Hand-marked machine inspection sheets April 2017 - Present
Advisors: Dr. Lovekesh and Dr. Gautam Shroff, TCS Innovation Labs

- While supervising large equipments such as gas turbines, engineers take notes of potential cracks/defects on inspection sheets which later get registered in the corresponding system's log template.
- Currently, we are building a system that comprises of three stages: text region localisation using image processing, character/digit classification using CNN and filling log via text classification.
- Our work enables the retrieval of information from inspection documents and filling system's log automatically using combination of image processing and deep learning techniques.

Acoustic Segment Modeling (ASM) using Spectral Clustering techniques Jan 2015 - June 2016
M.Tech Thesis Project, Advisor: Dr. K. Sri Rama Murty, IIT Hyderabad

- Motivated by the fact that transcribing speech data is laborious, we attempted to build unsupervised methods to model acoustic segments, i.e. finding underlying phoneme-like speech units.
- ASM is executed in three stages: initial segmentation of speech waveform using a thresholded distance, initial labeling of segments using clustering and iteratively modeling to purify segment boundaries.
- We utilize posterior distribution over the components of clustering as a feature representation for the task of language identification. We found that such an unsupervisedly learnt feature representation improves the accuracy of supervised method hence reducing the requirement of labeled data.

TECHNICAL SKILLS AND COURSES

Languages and Tools	Python, Theano, Keras, C, C++, Shell scripting, Matlab.
Courses	Deep learning, Machine learning, Computer vision, Image processing.

ACHIEVEMENTS

- Secured **All India Rank 432** - Top 0.2% (amongst 2,16,000) in GATE-2014.
- Secured **All India Rank 8507** - Top 1.2% (amongst 4,70,000) in IIT JEE-2010.

POSITION OF RESPONSIBILITY

- Teaching Assistantship for the courses of Probability and Random Process (Aug-Dec, 2015) and Adaptive Signal Processing (Jan-April, 2016), offered at IIT Hyderabad.
- Member of organizing committee of EFFICYLE 2012 and 2011 organized by SAE-INDIA.
- Certificate of appreciation by BLOOD DONATION CAMP organized in IIT Hyderabad.
- Member of organizing various cultural and other events at both school and college level.