Yashas Annadani

CONTACT INFORMATION

Department of Electrical and Electronics Engineering
National Institute of Technology – Karnataka
Room C410, Mega Tower 3
Surathkal, Mangalore (India) 575 025

Phone: +91-740-664-9709
E-mail: yashas_13ee152@nitk.edu.in
Home: https://yannadani.github.io

RESEARCH INTERESTS

Computer Vision, Artificial Intelligence, Machine Learning

EDUCATION

National Institute Of Technology – Karnataka, INDIA — August 2013 – June 2017
Bachelor of Technology (4th Year)
Major: Electrical and Electronics
CGPA: 9.16/10.0 (Upto 6th Semester)
4th in the department out of total 105 students

Shri Bhagawan Mahaveer Jain College, Bangalore, INDIA — June 2011 – March 2013
Pre-university
Core Subjects: Physics, Chemistry, Mathematics, Biology
CPI/Percentage: 95.25% (Core Subjects)

PUBLICATIONS

Annadani Yashas, Naganoor Vijayakrishna, Jagadish Akshay Kumar and Chemmangat Krishnan. **Selfie Detection by Synergy-Constraint based Convolutional Neural Network**. *12th IEEE International Conference on Signal Image Technology and Internet Based Systems (SITIS)*, Naples, Italy (2016). [pdf] [code]

Annadani Yashas, D. L. Rakshith and Biswas Soma. **Sliding Dictionary Based Sparse Representation For Action Recognition**. arXiv preprint *arXiv:1611.00218* (2016).[pdf] [code]

RESEARCH EXPERIENCE

Bachelor's Thesis — *Guide: Dr. Soma Biswas*
Department of Electrical Engineering, Indian Institute of Science — Aug 2016 – Present
Real-time Action Recognition by Convolutional Neural Network Mapping

- Existing methods use Optical Flow for obtaining motion information in CNN. However, optical flow extraction is computationally expensive and hinders real time recognition.
- Convolutional Neural Networks were used to learn mapping functions to map from static RGB domain to motion domain inherited from Improved Dense Trajectory (IDT) features. This mapping function once learnt during training was utilised during testing.
- Experiments were conducted on two large datasets -UCF-101 and HMDB-51 which yielded state-of-the-art results in terms of speed and accuracy.

Summer Research Intern — *Guide: Francois Bremond*
INRIA, France — May 2016 – July 2016
Deep Siamese CNN for large scale action recognition from RGBD data

- Used depth data in addition to RGB to enhance recognition performance.
- Approach involved Siamese networks, in which one channel was for RGB and the other channel for Depth. Static features were obtained from depth network and the motion features were obtained through LSTM appended to the RGB part of the network.

- Compact bilinear pooling was used to aggregate LSTM outputs over time. Finally, the RGB motion feature stream was fused with static depth feature stream for classification. Experimentation was carried out on NTU RGBD dataset (56k videos) and a private dataset of approximately 29TB of diskspace which yielded results competitive to the state-of-the-art.

Summer Research Fellow *Guide: Dr. Soma Biswas*
Department of Electrical Engineering, Indian Institute of Science May 2015 – July 2015
Human Action Recognition using 3D Skeletal Joints

- Although existing methods used different complex descriptors, their applicability to wide range of temporal scales, range and rate variations was limited. To overcome this, we proposed a sliding window based dictionary learning paradigm wherein each sliding window had different sparsities while maintaining temporal evolution. This helped to address the applicability to wide range of temporal scales.
- Augmented with a simple and complementary feature which calibrates each action to a baseline and then rate variation is accounted for in the difference of these features.
- Experiments conducted on 4 standard publicly available datasets yielded state-of-the-art results.

Professional Experience

Embedded Systems, Vector Institute Bangalore, India May 2014 – June 2014

- Implemented a GSM based home automation using 8051 microcontroller.
- Interfaced GSM module to microcontroller using I2C protocol and also tested using other microcontrollers.
- The project was preceded by a comprehensive learning of microcontroller architecture, assembly language, C and other concepts deemed necessary to deploy microcontrollers.

Skills and Coursework

- **Regular Coursework**
  Linear Algebra, Probability Theory, Pattern Recognition and Machine Learning, Signals and Systems, Digital Signal Processing, Single and Multi-variable Calculus, Linear Digital Control Theory, Advanced Digital Signal Processing.
- **Independent Coursework**
  - Image and Video Processing (by Guillermo Sapiro, Duke University) Coursera: Successfully completed course with **distinction**.
  - Machine Learning (by Andrew NG,Stanford University) Coursera
  - Design and Analysis of Algorithms, Part 1 (by Tim Roughgarden, Stanford University) Coursera
- **Computational Skills**
  C/C++, Python and Bash
- **Technical Skills**
  Matlab, OpenCV, Caffe, Torch and LaTeX.

Academic Research Projects

Selfie Classification on the web Jan 2016 – May 2016
Selfie Detection using Convolutional Neural Networks

Implemented a synergy constrained convolutional neural network, wherein the synergy measure was obtained by performing Canonical Correlation Analysis (CCA) on HOG agnd LBP features.

A dataset of selfie and non selfies was compiled and was compared with the performance of standard architectures(unconstrained) like Alexnet. Results indicated the superiority of the proposed approach over unconstrained networks.

Digital Electronics Course Project Aug 2015 – Sept 2015
Designing a SRF-PLL using FPGA

Detecting voltage imbalance of an inverter output by implementing a Synchronous Reference Frame Phase-Locked Loop (SRF-PLL) using a digital circuit. Developed VHDL blocks to achieve the task. The code was executed on Altera FPGA hardware.

Smartslate Project Dec 2014 – Feb 2015
Forming three-dimensional projections of a contour or any object which aids the blind

Built a refreshable tactile interface for the blind, that enables them to touch and grasp concepts. Implemented 8x8 matrix of actuators controlled by Raspberry pi and driven by 12V DC motor. Project was selected for display at project expo at **Rastrapati Bhavan, New Delhi.**

Facial Gender Recognition using Neural Networks March 2015 – May 2015
Biologically inspired gender recognition from facial images

Aim was to make the recognition task invariant to changes in age and external appearence. Various anatomical features which were found distinct to each gender (male and female) were extracted using Image processing techniques and classified using Neural Nets.

Academic Achievements

- Offered Mitacs Globalink Scholarship for Summer Research Internship in Canada (Declined).
- Secured Rank **126** in Karnataka Common Entrance Test (2013) among 150,000 entrants.
- Ranked in *top 1%* (All India) in JEE Main Entrance Exam (2013) for admission to NITs ,with a state rank of 255.
- Secured Rank **47** in COMED-K Entrance Exam (2013) from approximately 50,000 entrants.
- Secured distinction in Class 12 (*95.25 %*) board examination. Secured distinction in Class 10 ICSE (*94.6%*) board examinations and was the batch topper.

Extra - Curricular

- Member of the executive committee of IEEE NITK, which holds a good mix of workshops, talks, projects and competitions on various engineering and technological aspects.
- Delivered a workshop on Image Processing as part of IEEE at NITK (Jan 2015).
- Secured 3rd place in the competition *Velocity*, *ENGINEER 2013*, an RC car building and racing competition held at NITK which witnessed participants from all over the country (Oct 2013).
- Secured 4th place in the competition *Fuel RC2,TECH TATVA 13*, technical fest of Manipal Institute of technology among more than 20 teams from all over the country (Oct 2013).
- Love to play basketball regularly, avid reader of novels, music lover and travel enthusiast.

References

Available on request