Yash Sanjay Bhalgat

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EDUCATION

University of Michigan, Ann Arbor, MI   **2017-present**
Masters Student, Computer Science and Engineering
  · **Advisor**: Prof. Jia Deng

Indian Institute of Technology, Bombay, India   **2013-2017**
Bachelor of Technology, Department of Electrical Engineering

  · **Honors** in Electrical Engineering, **Minor** in Computer Science
  · **Advisor**: Prof. Vikram Gadre
  · **GPA**: 9.44/10

Research

PUBLICATIONS

- **CatsEyes: Categorizing seismic structures with scattering wavelet networks**
  Yash Bhalgat, Laurent Duval, Jean Charlety, *ICASSP 2017*. (Submitted, under review)

- **A Scattering Wavelet Network based approach to Fingerprint Classification**
  Parmeshwar Birajadar, *Yash Bhalgat*, Vikram Gadre, *Pattern Recognition Letters* (Under review)

- **Stamp Processing with Examplar Features**
  Yash Bhalgat, Mandar Kulkarni, Shirish Karande, Sachin Lodha, *12th IAPR workshop on Document Analysis and Systems (DAS), Greece, 2016.* Paper here

RESEARCH EXPERIENCE

Vision and Learning lab, University of Michigan, Ann Arbor
Human Pose Estimation
Guide: Prof. Jia Deng   *[Fall '17 - Ongoing]*
Working to further develop the architecture of the Stacked Hourglass network architecture (in a new PyTorch framework) for the task of human pose estimation.

IBM Research, Bangalore, India
Joint multi-modal representations for e-commerce catalog search by visual attributes
Guide: Dr. Vikas Raykar and Amrita Saha   *[Summer '16]*
Used CorrNets, an autoencoder-based architecture, to learn the joint representation for images and captions. State-of-art results for large fashion catalogues search without manual tagging.

Tata Research Design and Development Center, Pune, India
Object recognition in document images with semisupervised deep learning [arXiv]
Guide: Dr. Shirish Karande and Mandar Kulkarni   *[Dec '15]*
With specific recognition to stamp detection - segmentation, proposed a shape-based ranking algorithm to learn the 1st layer of a CNN. Detection accuracy 94% and segmentation IoU 74.81%.

TI-Digital Signal Processing Lab, IIT Bombay, Mumbai, India
[THESIS] Scattering Wavelet Network based approach to Fingerprint Classification
Guide: Prof. Vikram Gadre   *[Fall '16, Spring '17]*
Developed a block-wise algorithm using Scattering Wavelet Network based feature extraction to obtain better than state-of-art results on fingerprint classification with NIST-SD4 database.

Focus Analytics, Mumbai, India
Indoor Navigation System - Pedometry
Guide: Sudin Kadam and Manoj Gudi   *[Dec '14]*
Developed a pedometry-based indoor navigation system accurate to **1-1.5 meters**. Steps: processing cell-phone sensor-data and using TRIAD algorithm for real-time heading estimation.

PRESENTATIONS AND TALKS	• '*Scattering Wavelets Network based Latent Fingerprint Enhancement*', Research Scholars Conclave, College of Engineering, Pune (COEP) (March '17) • '*Stamp Processing with Examplar Features*', 12th IAPR workshop on Document Analysis Systems (DAS), Santorini, Greece (April '16) • '*Emotion from Speech*', TeQIP Seminar Poster Presentation, IIT Bombay, India (March '16) • '*How deep neural networks can be taught to classify images?*', Blog, Electronics Club, IIT Bombay [link](#)

TECHNICAL EXPERIENCE	**Navigation System Design of Autonomous Mars Rover, IIT Bombay** **Mars Society - University Rover Challenge, Utah** *[Aug '14-Mar '15]* Worked in the Navigation & Vision subsystem on Robotic Operating System (ROS), aimed to build a semi-autonomous prototype of a Mars rover. Used A-star algorithm for video-guided nav. **FOSSEE, IIT Bombay** **Development of SCILAB Image Processing Toolbox** *[Dec '15]* Developed moderate and hard-level functions (in Python and C++) for the Image Processing toolbox of Scilab. These will added to the newest version in Feb, 2016. **Infurnia, Mumbai** **Software module development using CAD modelling engine** *[Summer '15]* Created a range of *constraint-modules* and modified functions in FreeCAD for direct use without affecting backward compatibility in Python. Infurnia is a furniture-based startup in Mumbai.

Academic Experience and Achievements

KEY COURSE PROJECTS	• **Convolutional Neural Network from scratch**, Advanced Computer Vision [github] • **Exploring machine-learning ranking systems through the Yelp dataset**, Information Retrieval • **Sarcasm detection in sentences**, Machine Learning (CS 725) [github] • **Segmentation of MRI images using Expectation Maximization**, Estimation and Identification • **Computer Vision and Image Processing algorithms acceleration with CUDA**, High Performance Scientific Computing [github] • **Emotion from Speech extraction (CNNs, HMMs)**, DSP Poster presentation [github] • **Automated Stellarium Laser Pointing device**, Electronic Design Lab [youtube-demo]
RELEVANT COURSES	Advanced Computer Vision, Machine Learning, Computer Vision, High Performance Scientific Computing, Digital Image Processing, Matrix Computations, Design and Analysis of Algorithms, Advanced Topics in Signal Processing, Estimation and Identification, Probability and Data Analysis, Network Theory, Control Theory, Complex Analysis, Microprocessors
TECHNICAL SKILLS	• *Languages:* C/C++, Python, Bash, Java, Verilog, R • *Packages:* PyTorch, Theano, TensorFlow, OpenCV, Praat, CUDA, (basic) MPI, MATLAB • *Operating Systems:* ROS (Robot Operating System), GNU/Linux, Windows
SCHOLASTIC ACHIEVEMENTS	• All India Rank **12** in IITJEE-Mains exam among 1.5 mil students and AIR 155 in JEE-Advanced • All India Rank (AIR) **60** in KVPY Scholarship by Govt. of India among 0.2 million candidates • Featured in National Top 30 for the International Astronomy Olympiad, 2013 • Among top 300 in India to compete in the Physics, Chemistry and Mathematics olympiads. • Awarded Cargill Global Scholarship 2014-15 and selected in the 10-member Indian cohort to represent at the global seminar in Minneapolis, USA in 2016 • Winner of IMATATHON - Image Processing Hackathon held by Electronics Club, IIT Bombay