

# Yash Sanjay Bhalgat

Curriculum Vitae

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EDUCATION	<b>University of Michigan, Ann Arbor, MI</b> Masters, Computer Science and Engineering • GPA: 3.89/4.0 <b>Indian Institute of Technology, Bombay,</b> B.Tech. with Honors in Electrical Engineering and Minor in Computer Science • GPA: 9.44/10.0 <b>2013-2017</b>		
RELEVANT COURSES	Machine Learning, High Performance Scientific Computing, Advanced Computer Vision, Digital Image Processing, Matrix Computations, Design and Analysis of Algorithms, Data Structures and Algorithms, Probability and Data Analysis, Microarchitecture, Complex Analysis, Calculus		

## Research

PUBLICATIONS	<ul style="list-style-type: none"><li>• <b>Iris Classification Using Scattering Wavelet Network: An application to De-duplication</b> P. Birajadar, Yash Bhalgat, Meet Haria, et.al, <i>International Journal of Biometrics</i> (submitted)</li><li>• <b>CatsEyes: Categorizing seismic structures with scattering wavelet networks</b> Yash Bhalgat, Laurent Duval, Jean Charlety, <i>ICASSP 2018</i> [link] [Poster]</li><li>• <b>A Scattering Wavelet Network based approach to Fingerprint Classification</b> P. Birajadar, Yash Bhalgat, Vikram Gadre, <i>Pattern Recognition Letters</i> (Under 2nd review)</li><li>• <b>Stamp Processing with Exemplar Features</b> Yash Bhalgat, Mandar Kulkarni, Shirish Karande, Sachin Lodha, <i>DAS 2016</i> [arxiv]</li></ul>		
PROGRAMMING	<ul style="list-style-type: none"><li>• <b>Languages:</b> (proficiency: high to low) Python, C++, MATLAB, Java, Verilog, R, Julia, Bash</li><li>• <b>Packages:</b> PyTorch, Keras, Theano, TensorFlow, OpenCV, CUDA, python-flask, git</li></ul>		
INTERNSHIPS	<b>IBM Almaden Research Center, CA</b> [Summer '18 - Ongoing] <b>Classification in the presence of label noise in training data</b> Using deep learning and traditional ensemble based methods to filter mislabeled training samples. <b>IFPEN, Paris, Mentor - Laurent Duval</b> [Summer '17] <b>Categorization of seismic structures with scattering wavelet networks</b> Work accepted as a paper at ICASSP 2018. Proposed a method to give deformation invariant features of geophysical images using an unsupervised deep network, followed by feature selection. <b>Undergraduate Thesis, IIT Bombay, Guide: Prof. Vikram Gadre</b> [Jul '16 - Apr '17] <b>[THESIS] Scattering Wavelet Network based approach to Fingerprint Classification</b> Developed better than state-of-art algorithms for Fingerprint classification and Iris recognition, submitted to Pattern Recognition Journal and International Journal of Biometrics respectively. <b>IBM RESEARCH, Bangalore</b> [Summer '16] <b>Joint multi-modal representations for e-commerce catalog search by visual attributes</b> Used autoencoder based "CorrNets" to learn the joint representation for images and captions. <b>TATA RESEARCH DESIGN AND DEVELOPMENT CENTER, Pune</b> [Dec '15] <b>Object recognition in document images with semisupervised deep learning</b> [arXiv] Work submitted to DAS conference. Detection accuracy 94% and segmentation IoU 74.81%. <b>INFURNIA, Mumbai</b> [Summer '15] <b>Software module development using CAD modelling engine</b> Created a range of constraint-modules by modifying functions in FreeCAD in Python and C++.		

**FOCUS ANALYTICS, Mumbai**

[Dec '14]

**Indoor Navigation System - Pedometry**

Developed a pedometry-based indoor navigation Android application accurate to 1-1.5 meters.

**MARS SOCEITY OF INDIA, IIT Bombay**

[Aug '14-Mar '15]

**Navigation System Design - University Rover Challenge, Utah**

Worked in the Navigation &amp; 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.

**Academic Experience**

KEY COURSE	• <b>Convolutional Neural Network from scratch</b> , Advanced Computer Vision [ <a href="#">github</a> ]
PROJECTS	• <b>Exploring machine-learning ranking systems on the Yelp dataset</b> , Information Retrieval
	• <b>Sarcasm detection in sentences</b> , Machine Learning (CS 725) [ <a href="#">github</a> ]
	• <b>Segmentation of MRI images using Expectation Maximization</b> , Estimation and Identification
	• <b>Computer Vision and Image Processing algorithms acceleration with CUDA</b> , High Performance Scientific Computing [ <a href="#">github</a> ]
	• <b>Emotion from Speech extraction (CNNs, HMMs)</b> , DSP Poster presentation [ <a href="#">github</a> ]
	• <b>Automated Stellarium Laser Pointing device</b> , Electronic Design Lab [ <a href="#">youtube-demo</a> ]

**Miscellaneous**

SCHOLASTIC ACHIEVEMENTS	<ul style="list-style-type: none"> <li>• All India Rank <b>12</b> in IITJEE-Mains exam among 1.5 million students</li> <li>• All India Rank <b>155</b> in IITJEE-Advanced exam among 0.15 million students</li> <li>• All India Rank (AIR) <b>60</b> in KVPY Scholarship by Govt. of India among 0.2 million candidates</li> <li>• Featured in National Top 30 for the International Astronomy Olympiad, 2013</li> <li>• Among top 300 in India to compete in the Physics, Chemistry and Mathematics olympiads.</li> <li>• 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</li> <li>• Winner of IMATATHON - Image Processing Hackathon held by Electronics Club, IIT Bombay</li> </ul>
PRESENTATIONS AND TALKS	<ul style="list-style-type: none"> <li>• '<i>Scattering Wavelets Network based Latent Fingerprint Enhancement</i>', Research Scholars Conclave, College of Engineering, Pune (COEP) (March '17)</li> <li>• '<i>Stamp Processing with Exemplar Features</i>', 12th IAPR workshop on Document Analysis Systems (DAS), Santorini, Greece (April '16)</li> <li>• '<i>Emotion from Speech</i>', TeQIP Seminar Poster Presentation, IIT Bombay, India (March '16)</li> <li>• '<i>How deep neural networks can be taught to classify images?</i>', Blog, Electronics Club, IIT Bombay <a href="#">link</a></li> </ul>
TEACHING EXPERIENCE	<p><b>At University of Michigan - Ann Arbor</b>  Graduate Student Instructor, Introduction to Logic Design  <b>At Indian Institute of Technology, Bombay</b>  Teaching Assistant, Wavelets  Teaching Assistant, Quantum Mechanics and Applications</p>

Winter '18

Fall '16, Winter '17

Winter '15, Fall '15