Kumar Abhishek

B. Tech. - Electronics & Communication Engineering
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EDUCATION

Bachelor of Technology 2011-15
Indian Institute of Technology Guwahati
CGPA: 7.48/10.00

Higher Secondary 2011
Delhi Public School, Bokaro Steel City, Jharkhand
Score: 91.60%, Scholar Badge Awardee

Matriculation 2009
D.A.V. Public School, Koylanagar, Dhanbad, Jharkhand
Score: 98.33%, State Rank: 1, All India Rank: 3

WORK EXPERIENCE

Data Scientist, Altisource Business Solutions Pvt. Ltd. April 2017 - Present

- Worked on document image enhancement algorithms and OCR, and built tools for automatic information extraction from document images for loan underwriting.
- Developing an automated real estate image tagging platform using deep learning for classification of uploaded images into various scene categories.

Machine Learning Engineer, Wipro Limited July 2015 - March 2017

- Worked on fraud detection on internal employee data using big data and machine learning algorithms.
- Worked on a number of machine learning projects - from building an automated employee ticket handling system to predicting failures in a multi-node Hadoop cluster.

RESEARCH EXPERIENCE

Summer R&D Intern, Chief Technology Office, Wipro Ltd. May - July 2014
Optical character recognition of embossed digits on credit/debit cards
Guide(s): Raghavendra Hosabettu & Anil Kumar Lenka, Senior Consultants, CTO Team, Wipro Ltd.

Developed an algorithm for the optical character recognition (OCR) of embossed credit/debit card numbers from the card images captured using a mobile camera, reporting an accuracy of 83%.

Summer Research Intern, IIT Hyderabad May - July 2013
Point-of-care colorimetric detection using image processing
Guide: Dr. Sumohana Channappayya, Associate Professor, Dept. of Electrical Engineering, IIT Hyderabad

Developed an algorithm for quantifying the concentration of a hormone from the images of commercially available pregnancy test kits, using color space transformation followed by image segmentation and classification. The results were published in the National Conference on Communications 2014.

PUBLICATIONS

• K. Abhishek, A. Yogi, "A Minutiae Count Based Method for Fake Fingerprint Detection", in *ScienceDirect Procedia Computer Science*, 58, 447-452, Aug. 2015.

• K. Abhishek, A. K. Saxena, R. K. Sonkar, "Non-Invasive Measurement of Heart Rate and Hemoglobin Concentration Level through Fingertip", in Proc. of *IEEE International Conference on Signal Processing, Informatics, Communication and Information Systems 2015*, Kozhikode, India, Feb. 2015.

• K. Abhishek, M. Haloi, S. S. Channappayya, S. Vanjari, D. Dendukuri, S. Swathy, T. Choudhary, P. Bhandari, "An Enhanced Algorithm for the Quantification of Human Chorionic Gonadotropin (hCG) Level in Commercially Available Home Pregnancy Test Kits", in Proc. of *National Conference on Communications 2014*, Kanpur, India, Feb. 2014.

RELEVANT ACADEMIC PROJECTS

Bachelor Thesis Project: Broadcast Video Analytics August 2014 - March 2015
Guide: Dr. Prithwijit Guha, Assistant Professor, IIT Guwahati

Developed a robust news presentation format detector for identifying various band elements amd their layout in a news video frame. Reported a 0.81 Jaccard index for layout overlap with ground truth using data from recorded news videos of 4 English news channels. The results of the project are to be submitted to a journal.

Fake Fingerprint Detection April 2015

Guide: Dr. M. K. Bhuyan, Associate Professor, IIT Guwahati

Developed an algorithm for detecting fake fingerprints based on the minutiae count, which reported an accuracy of 85% on the FVC 2002-2006 dataset. The results were published in ScienceDirect Procedia Computer Science.

Non-Invasive Measurement of Human Blood Parameters February 2014 - April 2014

Guide: Dr. Ramesh K. Sonkar, Assistant Professor, IIT Guwahati

Developed a low-cost pulse oximeter to measure the heart rate and the hemoglobin concentration of an individual using near-infrared (NIR) light. The results were published in IEEE SPICES 2015, and we were awarded the Undergraduate Research Travel Grant by IIT Guwahati EEE Department.

IITG WebMail CAPTCHA Prediction October 2013

Self initiated project

Used image processing to denoise and pre-process the CAPTCHA images followed by character recognition to predict the CAPTCHAs presented at the login page.

RELEVANT COURSES

• **Mathematics and Computer Science:** Introduction to Computing, Linear Algebra, Real and Complex Analyses, Multivariable Calculus, Ordinary and Partial Differential Equations, Probability and Random Processes, Game Theory and Economics, Advanced Topics in Random Processes

• **Core Courses:** Signals, Systems & Networks, Digital Signal Processing, Pattern Recognition and Machine Learning, Digital Image Processing, Sparse Representation and Compressive Sensing, Computer Vision, Biometrics, Speech Technology

• **Independent Courses:** Computational Photography (MOOC), Image and Video Processing: From Mars to Hollywood with a Stop at the Hospital (MOOC), Fundamentals of Digital Image and Video Processing (MOOC), Deep Learning for Self Driving Cars (MIT 6.S094), Neural Networks for Machine Learning (MOOC)*, Neural Networks and Deep Learning (MOOC)*

***** - Ongoing

TECHNICAL SKILLS

• **Languages:** C, C++, Python, R*, Ruby*, Shell Scripting*

• **Web Technologies:** HTML, CSS, Javascript*, Jekyll, Hugo

• **Hardware Kits:** Arduino, Raspberry Pi

• **Software Packages:** Apache Hive, MySQL, LaTeX, MATLAB, Mathematica*, OpenCV

• **Environment:** Microsoft Windows, Linux

***** - Elementary proficiency

ACHIEVEMENTS

2017 Won the Wipro Datathon, a machine learning competition across all 11 offices of Wipro in India.

2015 Awarded **Undergraduate Research Travel Grant** (INR 10,000) to travel to and present a paper at IEEE SPICES.

2015 Selected amongst 11 candidates all over India for **the Tata Institute of Fundamental Research Graduate Studies PhD programme entrance examination** in Systems Sciences.

2015 Awarded **PhD fellowship by IIT Gandhinagar** under the Start Early PhD programme.

2011 Ranked among the **top 1% in IIT-JEE 2011** out of half a million students, and **5th in State level Engineering Entrance Exam**, JCECE 2011 out of over 50,000 students.

2009 Ranked 1st in my state and **3rd all over India in the CBSE Class 10th** Examination.

2009 Selected for the prestigious CSIR Programme on Youth for Leadership in Science (CPYLS) for excellent academic performance.

EXTRA-CURRICULAR ACTIVITIES

• **Quizzing:** Involved with Acumen, the IIT Guwahati Quiz Club for 4 years and organized and won many quizzes both at the institute and the city levels. Organized and hosted the General Quiz for the PES Fun Fiesta, the annual festival of Wipro's Product Engineering Services, which saw a turnout of around 200 participants.

• **Social Service:** Was an active member of the NSS (National Service Scheme) club, IIT Guwahati for 4 semesters and worked for the campus literacy programme by teaching basic arithmetic and English to the security guards.

• **Electronics Club:** Was an active member and a student mentor of the Electronics Club, IIT Guwahati and mentored projects on image processing.

• **Alcheringa:** Was a member of the Public Relations and Hospitality team of Alcheringa, the annual cultural festival of IIT Guwahati.