Abhilash Nandy

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Links to - **Google Scholar Profile** · **LinkedIn Profile**

Education

Indian Institute of Technology, Kharagpur

- *Doctor of Philosophy* in Computer Science and Engineering under the supervision of **Prof. Niloy Ganguly**; **Prime Minister's Research Fellow (PMRF)**
  Research Interests: Information Retrieval, Natural Language Processing 2020-Present

Indian Institute of Technology, Kharagpur

- *Bachelor of Technology Honors* in Electronics and Electrical Communication Engineering
  GPA (B.Tech): **9.21/10** 2015-19

Mahathi College, Visakhapatnam

- Secured **95.6%** in 12th Grade of Board of Intermediate Education Andhra Pradesh. 2015

Delhi public School, Visakhapatnam

- Secured a GPA of **10/10** in 10th Grade of Central Board of Secondary Education (CBSE) 2013

Relevant Coursework

- **PhD Courses**: Information Retrieval, Natural Language Processing, Advanced Machine Learning, Advanced Graph Theory, Complex Networks, AI and Ethics, Scalable Data Mining
- **UG Courses**: Programming and Data Structures, Matrix Algebra, Probability and Stochastic Processes, Signals and Systems, Control System Engineering, Digital Signal Processing, Digital Image Processing, Neural Networks and Applications, Machine Intelligence and Expert Systems, Artificial Intelligence, Digital Communication, Algorithms, Computer Architecture and Operating System, Intelligent Game Design

Publications

- **Accepted at ACL Workshop: Abhilash Nandy**, Sayantan Adak, Tanurima Halder, Sai Mahesh Pokala, "cs60075_team2 at SemEval-2021 Task 1 : Lexical Complexity Prediction using Transformer-based Language Models pre-trained on various text corpora" **Link to manuscript**
- **Accepted at EACL Workshop:** Kushal Kedia, **Abhilash Nandy**, "indicnlp@ kgp at DravidianLangTech-EACL2021: Offensive Language Identification in Dravidian Languages" **Link to manuscript**
- **Accepted at IEEE International Conference for Emerging Technology (INCET 2020): Abhilash Nandy**, Sushovan Haldar, Subhashis Banerjee, Prof. Sushmita Mitra, "A Survey on Applications of Siamese Neural Networks in Computer Vision" **Link to manuscript**
- **Accepted at WIDER Challenge Workshop held in conjunction with International Conference on Computer Vision 2019 (ICCV 2019): Abhilash Nandy**, "A Densenet based Robust Face Detection Framework" **Link to manuscript**
- **Accepted at IEEE CBMS 2019 Conference:** Gopabandhu Hota, **Abhilash Nandy**, Dishank Yadav, Kshitiz Goel, Saumo Pal, Ankush Roy, "An Adaptive Anaphylaxis Detection and Emergency Response System" **Link to manuscript**
- **Accepted at RFIW (Recognizing Families in the Wild) Workshop held in conjunction with IEEE FG 2019 Conference: Abhilash Nandy**, Shanka Subhra Mondal, "Kinship Verification using Deep Siamese Convolutional Neural Network" **Link to Manuscript**
- **Accepted at HUMANIZE Workshop, ACM IUI 2019**: Sopan Khosla, Siddhant Arora, **Abhilash Nandy**, Ankita Saxena and Anandhavelu N, "Understanding Community Rivalry on Social Media: A Case Study of Two Footballing Giants" **Link to manuscript**
- **Accepted at MedImage 2018 Workshop held in conjunction with The Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP) 2018: Abhilash Nandy**, Rachana Satish, Prof. Debdoot Sheet, "Identification of Cervical Pathology in Colposcopy Images using Adversarial Networks" **Link to manuscript**
- **Accepted at IEEE RTEICT 2018 Conference:** Adarsh Kumar Kosta, **Abhilash Nandy**, Chaitanya Paikara, Dishank Yadav, Souham Mandal, Shashikant Soren, "Low-cost Brain Con-

trolled Orthotic Exoskeleton Arm for Monoplegic Paralyzed Individuals" **Link to manuscript**
- **Arxiv submission:** Shanka Subhra Mondal, **Abhilash Nandy**, Ritesh Agrawal, Prof. Debashis Sen, "*KarNet*: An Efficient Boolean Function Simplifier" **Link to manuscript**

Technical Skills

- Programming Languages: Python, Java, C, C++, C#, Verilog
- Softwares: MATLAB, Maven, Game Development (Unity 3D), Xilinx ISE, Cadence
- Machine Learning Libraries: PyTorch, Tensorflow, Keras

Jobs

Indian Institute of Technology, Kharagpur — Feb. 2020 - Sep. 2020

Worked as a Project Scientist

- Worked on a project on automated question answering on device E-Manuals.

Adobe India, Noida — June 2019 - Dec. 2019

Acquired an experience of 6 months working as a Software Development Engineer.

- Was a part of the team working on the Adobe Experience Manager (AEM).
- Worked on both the frontend and backend parts of the codebase.

Internships

Adobe Big Data Experience Labs, Bangalore — May-July 2018

*Research Intern under **Mr. A.Natarajan** and **Mr. S.Khosla**, Researchers at Adobe Research*

Analysing and understanding Community Rivalry in twitter

- Worked with two other co-interns in the problem area of 'Managing Toxic Content Online'
- Built an engine which detected and analyzed hate originators and propagators
- Implemented a web demo of the solution and the work led to a publication.

TCS Innovation Labs, Noida — Dec. 2017

*Research Intern under **Mr. Pankaj Malhotra**, Researcher at TCS Innovation Labs.*

Anomaly Detection in data collected from sensors

- Worked in the CTO Project using deep learning methods.
- Used Convolutional Neural Networks (CNNs) to learn from data

ISI(Indian Statistical Institute), Kolkata — May-June 2017

*Intern at MIU(Machine Intelligence Unit) under **Prof.Sushmita Mitra**, Head of MIU, ISI Kolkata*

Study on one-shot learning tasks and Siamese Networks

- Tried implementing two papers from good conferences.
- Did a survey on one-shot learning and siamese neural networks.

Research Experience

Kharagpur Learning, Imaging and Visualization Group, IIT KGP — July 2018 - April 2019 (7^{th} and 8^{th} semesters of BTech.)

*Bachelor Thesis under **Prof. Debdoot Sheet**, Dept. of Electrical Engg. and **Mrs. Rachana Satish***

Screening of cervical cancer from cervicography images

- Used attention based models and adversarially trained networks in order to learn features from less data and use less resources in terms of memory and time.
- Compared with some pretrained models as baselines
- The work led to a publication.

CS VLSI Hardware Lab, IIT Kharagpur — Aug.-Sept. 2017

*Project under **Prof. Pabitra Mitra** and **Prof. Pradip Das**, Department of CSE, IIT Kharagpur*

Hardware Implementation of Spiking Neural Networks

- Used MATLAB Simulink-Xilinx Blockset for hardware implementation of pre-trained Spiking Neural Network on FPGA toolkit.

Computer Vision Lab, E&ECE Department, IIT Kharagpur — Aug.-Sept. 2017

*Project under **Prof. Prabir Kumar Biswas**, **Head Of Department of E&ECE**, IIT Kharagpur*
Anomaly Detection in video frames using Deep Convolutional Neural Networks

- Worked on the publicly available UCSD video surveillance dataset.
- Divided each frame into patches. Optical flow values were calculated for each frame. Spatio-temporal CNN was applied on optical flow values obtained from the patches.
- Also implemented CNN with autoencoder block with the frames as the inputs followed by a Gaussian Classifier anomaly detection.

MNFIC (M.N.Farooqui Innovation Centre), IIT Kharagpur May 2016
*Summer Project under **Prof C.S.Kumar**, Department of Mechanical Engineering, IIT Kharagpur.*
Member of a team of three

- Involved in making an outdoor sensor-based lighting system, with the idea of incorporating the concept of IoT (Internet of Things)

Term Projects

- **Biometric Authentication using Mouse Dynamics:** Mouse Dynamics features were used for training a SVM to differentiate genuine from impostor users. Fall 2018
- **Using Neural Networks to simplify Boolean Expressions with less space complexity:** Solving Karnaugh Maps in an automated fashion using Convolutional Neural Networks Fall 2018

Academic and Non-Academic Achievements

- Reviewer for **Winter Conference on Applications of Computer Vision (WACV 2020)**.
- Qualified for **NTSE (National Talent Search Examination Scholarship)**, conducted by **NCERT (National Council of Education Research and Training)**
- Ranked in the **top 0.06 percent** in **JEE Advanced 2015** out of 1.4 million students
- Among **top 1%** in **Deep Learning Challenge 3** (Sept., 2017) conducted by **HackerEarth**.

Competitions Won and Other Projects

Qualcomm Innovation Fellowship Competition, Qualcomm June 2021

- Finalist; 1 of the 36 teams to be selected for the Final from 95 submissions from 13 participating universities.
- Proposal: Question Answering in E-Manuals

Data Tussle 2019, IIT Kharagpur March 2019

- A Kaggle Data Analytics Competition - `https://www.kaggle.com/c/iitkgpsmd`
- Given various attribute values of waves, objective was to predict the height of waves.
- Our team (KingSlayer) secured first place in the competition.

GE Healthcare Precision Health Challenge, Bengaluru Dec 2018

- Designed an Adaptive Anaphylaxis Detection System
- Anomaly Detection and adversarial classifier to detect Anaphylaxis from ECG data.
- Our team was among the top 10 teams in the competition.

Hardware Modeling Competition, IIT Kharagpur March 2018

- Designed brain of a prosthetic arm
- Arm movements could be controlled by the face expressions of the person wearing it by decoding EEG signals using convolutional neural networks on time series data.
- Our team secured the first place in the competition. The work also led to a publication.

Data Analytics Competition, IIT Kharagpur Feb 2017

- Two datasets were given, one with California's demographic information and other with list of ATMs owned by 3 major ATM operators in California.
- Evaluated the competitive strength of competitors among ATMs across California
- Our team secured the second place in the competition.