


# Dr. Gourav SIDDHAD

Ph.D. | Computer Science | IIT Roorkee


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Research Interest : Brain-Computer Interface (BCI) Electroencephalography (EEG) Cancelable Biometrics Deep Learning Image Processing

## EDUCATIONAL QUALIFICATIONS

April 2025 August 2020	<b>Ph.D., INDIAN INSTITUTE OF TECHNOLOGY, Roorkee</b> <ul style="list-style-type: none"><li>&gt; Computer Science   8.57/10</li><li>&gt; Thesis - Towards Human Behavior Prediction using EEG: Analyzing Cognitive Workload and Emotional Responses</li><li>&gt; 15 Days visit to Japan under Sakura Science Program 2022, sponsored by the Japan Science and Technology Agency (JST),</li></ul> <span>BCI</span> <span>Deep Learning</span> <span>EEG</span> <span>Image Processing</span> <span>Python</span>
August 2020 July 2018	<b>M.Tech., PDPM INDIAN INSTITUTE OF INFORMATION TECHNOLOGY, DESIGN AND MANUFACTURING, Jabalpur</b> <ul style="list-style-type: none"><li>&gt; Computer Science   8.3/10</li><li>&gt; Thesis - Cancelable Biometric Templates for Low-End Devices</li><li>&gt; IIITDMJ Proficiency Prize (Silver Medal for the Best Thesis among PG Students of CSE)</li></ul> <span>Cancelable Biometrics</span> <span>Deep Learning</span> <span>Image Processing</span> <span>Python</span>
May 2017 July 2013	<b>B.Tech., HANSRAJ COLLEGE, University of Delhi, Delhi</b> <ul style="list-style-type: none"><li>&gt; Computer Science   69.02 %</li></ul> <span>C++</span> <span>Java</span> <span>Android</span>
April 2013 July 2012	<b>AISSCE, CBSE, EMERALD HEIGHTS INTERNATIONAL SCHOOL, Indore</b> <ul style="list-style-type: none"><li>&gt; PCM + CS   91.4 %</li><li>&gt; Certificate of Excellence (Best in Computer Science)</li></ul> <span>C</span> <span>C++</span>
April 2011 July 2010	<b>AISSCE, CBSE, EMERALD HEIGHTS INTERNATIONAL SCHOOL, Indore</b> <ul style="list-style-type: none"><li>&gt; 8.8/10 CGPA</li></ul>

## DISSERTATIONS

### TOWARDS HUMAN BEHAVIOR PREDICTION USING EEG: ANALYZING COGNITIVE WORKLOAD AND EMOTIONAL RESPONSES

AUGUST 2020 - APRIL 2025

IIT Roorkee

The dissertation carried out is based on Human Behavior Prediction on EEG data using machine and deep learning based methods. The work also includes rigorous analysis of the methods formulated and implementation of state-of-the-art work done in the field. This work was done under the guidance of Dr. Partha Pratim Roy (Associate Professor, IIT Roorkee).

BCI EEG Deep Learning

### CANCELABLE BIOMETRIC TEMPLATES FOR LOW-END DEVICES

DECEMBER 2018 - AUGUST 2020

PDPM IIITDM Jabalpur

The dissertation carried out is summarized as cancelable biometric template generation for unimodal and multimodal biometric authentication using traditional as well as deep learning based methods for low-end devices. The work also includes rigorous analysis of the cancelable biometric schemes formulated and implementation of state-of-the-art work done in the field. This work was done under the guidance of Dr. Pritee Khanna (Professor, PDPM IIITDM Jabalpur).

Cancelable Biometrics Cryptography Image Processing Deep Learning

## SKILLS

<b>Programming</b>	Python, C++, Java, Android, Matlab
<b>Frameworks</b>	PyTorch, Keras, Tensorflow, EEG-Lab
<b>Development Tools</b>	Visual Studio Code, IntelliJ Idea, Eclipse, git
<b>Operating Systems</b>	Mac OS, Windows, Linux
<b>Other Skills</b>	Raspberry Pi

## PUBLICATIONS

Journal Submitted	Gourav Siddhad, Masakazu Iwamura, and Partha Pratim Roy. <b>Enhancing EEG Signal-based Emotion Recognition with Synthetic Data: Diffusion Model Approach.</b> 10.48550/arXiv.2401.16878
Journal Submitted	Gourav Siddhad, Anurag Singh, Rajkumar Saini, and Partha Pratim Roy. <b>Modified TSception for Analyzing Driver Drowsiness and Mental Workload from EEG.</b>
Journal Submitted	Gourav Siddhad, Juhi Singh, and Partha Pratim Roy. <b>MECASA: Motor Execution Classification using Additive Self-Attention for Hybrid EEG-fNIRS Data.</b> 10.48550/arXiv.2501.05525
Conference	Gourav Siddhad, Sayantan Dey, and Partha Pratim Roy. <b>DrowzEE-G-Mamba: Leveraging EEG and State Space Models for Driver Drowsiness Detection</b> , 27th International Conference on Pattern Recognition (ICPR), 2024. 10.1007/978-3-031-78398-2_19
Conference	Gourav Siddhad, Sayantan Dey, Partha Pratim Roy, and Masakazu Iwamura. <b>Awake at the Wheel: Enhancing Automotive Safety through EEG-Based Fatigue Detection</b> , 27th International Conference on Pattern Recognition (ICPR), 2024. 10.1007/978-3-031-78195-7_23
Conference	Gourav Siddhad, Partha Pratim Roy, and Byung-Gyu Kim. <b>Neural Network Meet Neural Activity: Utilizing EEG for Mental Workload Estimation</b> , 27th International Conference on Pattern Recognition (ICPR), 2024. 10.1007/978-3-031-78195-7_22
Journal [Q1—IF:5.1]	Gourav Siddhad, Anmol Gupta, Debi Prosad Dogra, and Partha Pratim Roy. <b>Efficacy of Transformer Networks for Classification of Raw EEG Data</b> , Biomedical Signal Processing and Control, 87, Part B, 105488, 2024. 10.1016/j.bspc.2023.105488
Journal [Q2—IF:1.1]	Gourav Siddhad and Pritee Khanna. <b>Max-Min Threshold based Cancelable Biometric Templates for Low-end Devices</b> , Journal of Electronic Imaging, 31(3), 033025, 2022. 10.1117/1.JEI.31.3.033025
Journal [Q1—IF:3.9]	Anmol Gupta, Gourav Siddhad, Vishal Pandey, Partha Pratim Roy, and Byung-Gyu Kim. <b>Subject-Specific Cognitive Workload Classification Using EEG-Based Functional Connectivity and Deep Learning</b> , MDPI Sensors, 21(20):6710, 2021. 10.3390/s21206710
Conference	Gourav Siddhad, Pritee Khanna, and Aparajita Ojha. <b>Cancelable Biometric Template Generation Using Convolutional Autoencoder</b> , International Conference on Computer Vision and Image Processing (CVIP), Springer, 303-314, 2021. 10.1007/978-981-16-1086-8_27

## PROJECTS

June 2022 January 2023	<b>MLTRI: Multi-Lingual Text Recognition and Interpretation, IIT, Roorkee</b> This project was funded by National Informatics Center (NIC) under the aegis of the Department of Ministry of Electronics and Information Technology, Government of India. <span>Python</span> <span>NLP</span> <span>Deep Learning</span>
March 2020 December 2018	<b>PERBI: Privacy Enhancing Revocable Biometric Identities, PDPM IIITDM, Jabalpur</b> Designed and developed a user-friendly GUI for an identity verification system employing the Random Distance Method (RDM) cancelable biometric scheme proposed by H. Kaur and P. Khanna. Successfully implemented the system on a real device. This project was funded by BRNS (BARC) under the aegis of the Department of Science and Technology, Government of India. <span>Python</span> <span>Cancelable Biometrics</span> <span>Cryptography</span> <span>Raspberry Pi</span>
December 2019 July 2019	<b>BW2RGB: Gray to Color Image Conversion, PDPM IIITDM, Jabalpur</b> Converts grayscale images or videos to color and enhances color fidelity using Multi-Resolution Analysis (MRA). <span>Neural Networks</span> <span>Keras</span> <span>Python</span> <span>Multimedia Processing</span>
April 2019 January 2019	<b>Text Classification, PDPM IIITDM, Jabalpur</b> Performed text classification on the Reuters-21768 Newswire dataset. <span>Machine Learning</span> <span>Deep Learning</span> <span>Natural Language Processing</span> <span>Keras</span> <span>Python</span>
April 2017 January 2017	<b>Home of Recipes, HANSRAJ COLLEGE, UNIVERSITY OF DELHI, Delhi</b> Developed an Android cooking recipe app featuring ingredient-based recipe search and other functionalities. <span>Android App</span> <span>Java</span>
March 2016 January 2016	<b>Exam Paper Generator, HANSRAJ COLLEGE, UNIVERSITY OF DELHI, Delhi</b> Develops and manages the question paper generation process, including obtaining necessary approvals from organizational heads and subject matter experts prior to exam printing. <span>Software Engineering</span>
March 2013 January 2013	<b>Final Destination, EMERALD HEIGHTS INTERNATIONAL SCHOOL, Indore</b> Keyboard and mouse-controlled game featuring eight progressively challenging levels. <span>Turbo C++</span> <span>C/C++ Graphics</span>

## EXPERIENCE

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February 2025 September 2024	Intern, IIT, Indore <span>BCI</span> <span>Deep Learning</span> <span>EEG</span> <span>Python</span> <span>Signal Processing</span>
Present December 2023	Assistant to Associate Editor, IIT, Roorkee Assistant to Associate Editor of IEEE Transactions on Circuits and Systems for Video Technology (TCSVT), <span>Machine Learning</span> <span>Deep Learning</span> <span>Review</span>
September 2024 August 2020	Teaching Assistant, IIT, Roorkee <span>Faculty TA</span> <span>SQL</span> <span>AI</span> <span>Data Science</span> <span>Data Structure</span> <span>Algorithms</span> <span>Compiler</span>
April 2024 April 2024	Teaching Assistant, IIT, Roorkee Certificate Course on Big Data Analytics for ITS Officers <span>Machine Learning</span> <span>Deep Learning</span>
March 2022 December 2021	Teaching Assistant, TIMES TSW AND IIT, Roorkee Certificate Program in Machine Learning (CPML) <span>Machine Learning</span>
July 2020 July 2018	Teaching Assistant, PDPM IIITDM, Jabalpur <span>Algorithms</span> <span>C</span> <span>Data Structures</span> <span>DBMS</span> <span>HTML</span> <span>Java</span> <span>SQL</span>
March 2018 January 2018	Trainer, INFOZONE INFORMATICS, Indore Taught Students - Programming fundamentals, OOP concepts, and Microsoft Office <span>C</span> <span>C++</span> <span>Java</span> <span>MS-Office</span>

## CERTIFICATIONS

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February 2018	GATE   Score - 513   AIR - 3605
February 2017	GATE   Score - 324   AIR - 14454
Mar-May 2009	Honors Diploma in C and C++
May-July 2005	Honors Diploma in Computer Application

## HONORS AND AWARDS

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April 2021	IIITDMJ Proficiency Prize (Silver Medal) during Convocation held at/by PDPM IIITDM Jabalpur for Best Thesis among the Post Graduate students of Computer Science and Engineering Discipline in Graduating class of 2020.
July 2013	Certificate of Merit by Central Board of Secondary Education for outstanding academic performance and being among the top 0.1 % of successful candidates of AISSCE 2013 in Computer Science

## LANGUAGES

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English ●●●●○  
Hindi ●●●●○

## STRENGTHS

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- > Determined
- > Exuberant
- > Self Motivated

## OUTREACH AND VOLUNTEERING

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June 2020 July 2019	Student Senate, PDPM IIITDM, Jabalpur > Member of the Student Senate
February 2020	Volunteer, PDPM IIITDM, Jabalpur > ISEC 2020 (Innovations in Software Engineering Conference)
March 2019	Volunteer, PDPM IIITDM, Jabalpur > DeW 2019 (Design Workshop)
July 2012 April 2013	Prefect, THE EMERALD HEIGHTS INTERNATIONAL SCHOOL, Indore > Member of Discipline Team