Dr. AISWARYA DEV GOSWAMI

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https://www.researchgate.net/profile/Aiswarya-Goswami

Technical Skills

TinyCAD • Microsoft Visual Studio Code • Origin (Software) • Proteus 8 • ESP32 Microcontrollers • Arduino IDE • Arduino Microcontrollers • Control Systems Design • EEG Analysis (EEGLAB) • ML • Computer-Aided Design (CAD) • C/C++ (Programming Language) • AutoCAD • MATLAB •DIALux • MAXWELL 2D • RMxpert • Embedded Systems • IoT • Python • PyTorch / TensorFlow

Summary

I am a research scholar at the Electrical Engineering Department, Jadavpur University, focusing on the application of AI and machine learning to study the impact of illumination on human behavior and neural responses. My expertise includes AI-driven data analytics, predictive modeling, IoT-enabled systems, with extended expertise in ML-based EEG signal processing applications and embedded solutions for cognitive studies. Passionate about innovation, I aim to develop technologies that enhance human health and well-being, with interests in smart lighting, AI, ML, IoT, and biotechnology applications. I possess extensive and advanced experience with Arduino Uno and Mega, ESP8266, and ESP32 microcontrollers, as well as proficiency in MATLAB, Embedded C, and Python programming.

Education

Ph.D. Candidate in Electrical Engineering
Dec 2020 – Aug 2025

Jadavpur University-Electrical Engineering Dept.-Section of Illumination Engineering
Guide: **Prof. Dr. Suddhasatwa Chakraborty**
Dissertation: *Studies on Human Centric Smart Street Lighting System in Indian Context and its effect on Drivers' Responses* **[ADF Scholar]**

M.E. in Illumination Engineering
Aug 2018 - Sep 2020

Jadavpur University-Electrical Engineering Dept.-Section of Illumination Engineering
Guide: **Prof. Dr. Saswati Mazumdar**
Thesis: *Design and Development of a GSM Based Arduino Controlled Smart Street Lighting System with Remote Controlling and Illuminance Logging Systems: An Approach towards Smart Lighting*
CGPA – 8.34
Overall – 78%

B.E. in Electrical Engineering
June 2014 - July 2018

Jadavpur University-Electrical Engineering Dept.
CGPA – 7.6
Overall – 70.31%

Higher Secondary
Passed – 2014

WBCHSE
Math – 97%; Phy - 83%; Chem – 94%; Stat – 90%
Overall – 88.6%

Secondary
Passed - 2012

WBBSE
Math – 100%; Phy Sc. - 99%; Life Sc. – 97%
Overall – 92.86%

Experience

PHD Scholar - Jadavpur University - Dec 2020 – Aug 2025 (4 years 8 months)
Supervisor: Dr. Suddhasatwa Chakraborty

Defence Research and Development Organisation - May 2017 - June 2017 (2 months)
Thesis: *Design of a Brushless Permanent-Magnet DC Motor*
Supervisor: Mr. Asish Dutta

INDIAN RAILWAYS - Jul 2016
Adra Division

WBSEDCL - Jun 2016
PPSP, Purulia

Publications

1. Goswami, Aiswarya Dev, Basudeb Das, and Saswati Mazumdar. "**DEVELOPMENT OF A GSM BASED ARDUINO CONTROLLED SMART STREET LIGHTING SYSTEM.**" Light & Engineering 30, no. 1 (2022). [*Built a Smart Lighting Solution using GSM and various sensors like PIR, Current, Illuminance sensors with manual and sensor modes*]
2. Chakraborty, Suddhasatwa, Aiswarya Dev Goswami, and Saswati Mazumdar. "**Beam controlled lighting design: An approach towards optimization of road lighting design**." Optik 261 (2022): 169165. [*Proposed a new dimming technique in LED street lighting (e.g. beam angle switching), which is efficient than PWM dimming*]
3. Goswami, Aiswarya Dev, Jyotipriya Roy, Atanu Naskar, and Suddhasatwa Chakraborty. "**A laboratory-based study on the effect of CCT change of LED light sources on reaction time and visibility level for object recognition.**" Optik 264 (2022): 169353. [*Explored the effect of CCT of LED on object detection by human being using reaction time measurement. Also quantified effect of CCT on small target visibility (STV) and visibility level (VL)*]
4. Goswami, Aiswarya Dev, Suddhasatwa Chakraborty, Budhaditya Ghosh, Jyotipriya Roy, and Atanu Naskar. "**A laboratory-based study on the effect of peripheral flickering LED sources on reaction time of drivers for object recognition.**" Optik 273 (2023): 170428. [*Explored the effect of flickering phenomenon of LED on object detection by human being using reaction time measurement and behavioural assessment of the task*]
5. Goswami, Aiswarya Dev, and Suddhasatwa Chakraborty. "**ROAD LIGHTING STANDARDS'EVOLUTION AND FUTURE DEVELOPMENT OF SMART STREET LIGHTING BASED UPON USERS' PERFORMANCE IN VIEW OF HUMAN CENTRIC LIGHTING: A REVIEW**." Light & Engineering 31, no. 5. [*Thoroughly explored various country's road lighting standards, compared them and ultimately proposed addition and alteration in Indian street lighting standards and government policies*]
6. Chakraborty, Suddhasatwa, Gaurav Chakraborty, Aiswarya Dev Goswami, and Jyotipriya Roy. "**STUDY OF THE HARMONIC ANALYSIS OF THE HIGH-INTENSITY DISCHARGE LAMPS.**" Light & Engineering 31, no. 4. [*Explored the harmonic contents in lamp voltage and supply current waveforms of used lamp ballasts and lamps with high intensity discharges*]
7. Goswami, Aiswarya Dev, Jyotipriya Roy, Suddhasatwa Chakraborty, and Pallav Dutta. "**An experimental analysis of object recognition performance under different lighting scenes for varying CCT of LED light sources.**" In 2023 IEEE Sustainable Smart Lighting World Conference & Expo (LS18), pp. 1-6. IEEE, 2023. [*Explored the effect of CCT of LED on object detection by human being using behavioural assessment of the task in each created lighting condition*]
8. Goswami, Aiswarya Dev, Anirban Ghosh, Jyotipriya Roy, and Suddhasatwa Chakraborty. "**Studies on Driver's Response with Peripheral Moving Targets under Different Road Lighting Situations-A Realistic Approach.**" National Science Congress on Illumination: Luminescence 2023 2 (1), 72-83. [*Explored the effect of four street lights (HPSV, MHL, CDM-TT and LED) on object detection by human drivers using reaction time measurement in a real street using a car*]
9. Goswami, Aiswarya Dev, Jyotipriya Roy, and Suddhasatwa Chakraborty. "**Study on Implementation of PWM Dimming in Beam Angle Switched LED Street Light to Achieve Energy Efficient Standard Lighting**." In 2023 IEEE 3rd Applied Signal Processing Conference (ASPCON), pp. 33-37. IEEE, 2023. [*Explored the effect of amalgamation PWM dimming and BAS method on lighting parameters of street lighting and energy saving potential of the street light*]
10. Roy, Jyotipriya, Aiswarya Dev Goswami, and Suddhasatwa Chakraborty. "**Implementation of Beam Angle Switching in Smart LED Street Lighting System Using MQTT Protocol**." In 2023 IEEE 3rd Applied Signal Processing Conference (ASPCON), pp. 38-43. IEEE, 2023. [*Implemented MQTT protocol in smart street lights to ensure wireless remote controlling and monitoring*]
11. Goswami, Aiswarya Dev, Jyotipriya Roy, Suddhasatwa Chakraborty, and Badal Sarkar. "**Case study of street lighting of an Indian University: present and future**." Journal of Optics (2024): 1-10. [*Explored the energy saving capability of BAS method in street lights of Jadavpur University campus, when all street lights are retrofitted with BAS enabled LED systems. Also did a case study on energy consumption of existing street lighting systems in this campus*]
12. Goswami, Aiswarya Dev, Jyotipriya Roy, Suddhasatwa Chakraborty, and Sayanti Bag. "**VALIDATION OF BEAM ANGLE SWITCHING METHOD USING A LED LUMEN MAINTENANCE TESTING DEVICE.**" *Light & Engineering* 32, no. 2. [*Validated BAS method using a novel lab grown device and experimented on Illuminance sustenance of LED and temperature rising in LED junction if BAS method is employed*]

13. Roy, Jyotipriya, Aiswarya Dev Goswami, Suddhasatwa Chakraborty, Subhajit Mandal, and Nurjahan Khatun. "**A message queuing telemetry transport (MQTT) protocol-based energy-efficient smart, wireless LED street lighting solution**." *Journal of Optics* (2024): 1-14. [*Developed a smart BAS method enabled, wirelessly controlled and monitored street lighting system using MQTT protocol*]
14. A. D. Goswami, J. Roy, S. Dey and S. Chakraborty, "**Development of A Low-Cost Novel CCT Meter using Machine Learning Regression Techniques to Estimate Real-time CCTs**," 2024 IEEE Calcutta Conference (CALCON), Kolkata, India, 2024, pp. 1-5, doi: 10.1109/CALCON63337.2024.10914325. [*Developed a low-cost CCT measuring device using ML model which outperforms existing Mccammy's model*]
15. J. Roy, A. D. Goswami and S. Chakraborty, "**A Machine Learning Based Laboratory Simulated Experiment for Determining the Effect of Varying Correlated Color Temperature of LED Sources on Close Proximity Task Performances**," *2024 IEEE Calcutta Conference (CALCON)*, Kolkata, India, 2024, pp. 1-5, doi: 10.1109/CALCON63337.2024.10914114. [*Developed a ML model to predict reaction time from ambient CCT level of LED using abstract task (e.g. Landolt's ring)*]
16. Goswami, Aiswarya Dev, Jyotipriya Roy, Pallav Dutta, and Suddhasatwa Chakraborty. 2025. "**Impact of Different Switching Frequencies of Pulse Width Modulated Signal on Various Lighting Parameters of LEDs.**" LEUKOS, May, 1–15.doi:10.1080/15502724.2025.2499555. [*Studied the effect of various switching frequencies of PWM signal on CCT and CRI of LED light sources to find optimum switching frequency level*]

Communicated

17. Aiswarya Dev Goswami, Jyotipriya Roy, Suddhasatwa Chakraborty. **"A Laboratory Based Investigation into the Impact of CCT Variations of LED on Human Object Recognition: A Novel Approach Using EEG and GSR".** [*Studied the effect of CCT of LED light sources on object detection task by human being under lab developed lighting conditions using reaction time measurement, behavioral study using likert's scale, EEG and GSR study to find optimum CCT level for street lighting*]
18. Aiswarya Dev Goswami, Jyotipriya Roy, Suddhasatwa Chakraborty. **"Development of a Low-Cost, High CRI, BAS Enabled Smart Human Centric Street Lighting Luminaire".** [*Developed a smart human centric street lighting system with BAS method, PWM dimmability, CCT tunability and wireless remote controllability, where each of the three LED clusters can be controlled individually*]

Teaching Experience

2nd Sem, 2020	Sessional Lab-Electrical Engineering Dept. (UG-4) – Jadavpur University
1st Sem, 2021	Sessional Lab-Electrical Engineering Dept. (UG-4) – Jadavpur University
2nd Sem, 2021	Sessional Lab-Electrical Engineering Dept. (UG-4) – Jadavpur University
1st Sem, 2022	Sessional Lab-Electrical Engineering Dept. (UG-1 & UG-4) – Jadavpur University
2nd Sem, 2022	Sessional Lab-Electrical Engineering Dept. (UG-1 & UG-4) – Jadavpur University
1st Sem, 2023	Sessional Lab-Electrical Engineering Dept. (UG-1 & UG-4) – Jadavpur University
2nd Sem, 2023	Sessional Lab-Electrical Engineering Dept. (UG-1 & UG-4) – Jadavpur University
1st Sem, 2024	Sessional Lab-Electrical Engineering Dept. (UG-1 & UG-4) – Jadavpur University
2nd Sem, 2024	Sessional Lab-Electrical Engineering Dept. (UG-1 & UG-4) – Jadavpur University

Conferences

May 2023	Paper Presentation: *Studies on Driver's Response with Peripheral Moving Targets under Different Road Lighting Situations: A Realistic Approach* National Science Congress on Illumination: Luminescence 2023 Jadavpur University, Kolkata, India
June 2023	Paper Presentation: *An Experimental Analysis of Object Recognition Performance Under Different Lighting Scenes for Varying CCT of LED Light Sources* IEEE Sustainable Smart Lighting World Conference & Expo (LS:18) MPSTME, Mumbai, India
November 2023	Paper Presentation: *Study on Implementation of PWM Dimming in Beam Angle Switched LED Street Light to Achieve Energy Efficient Standard Lighting* 3rd IEEE Conference on Applied Signal Processing, ASPCON 2023 HIT, Haldia, India

December 2023 Sessional Talk: *Development of a Green Human Centric Smart Street Light with Mixed Dimming Technique*
GREENINVENT – 2023 powered by IEEE PES Kolkata Chapter
Kolkata, India

December 2024 Paper Presentation: *Development of A Low-Cost Novel CCT Meter using Machine Learning Regression Techniques to Estimate Real-time CCTs*
2024 IEEE Kolkata Section Flagship Conference (CALCON)
Jadavpur University, Jadavpur, India

Additional Skills

Languages – Bengali, English, Hindi

References

Prof. Dr. Suddhasatwa Chakraborty, Ph.D.
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