

Koushik Roy

Data Scientist - Deep Learning Researcher

+8801623994430 | House-1, Road-13D, Sector-6, Uttara, Dhaka, Bangladesh
rkoushikroy2@gmail.com | k-roy | Koushik-Roy-6 | koushikroy

Work Experience

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| Sep 2021 - Present [Full Time] | Data Scientist <i>Nybbles Systems Ltd.</i> <ul style="list-style-type: none">Mixed fidelity synthetic data generation by combining previous high fidelity and low fidelity datasets.Human fall detection and real-time notification system using sensor data from mobile phone.Driver's attention detection with eye aspect ratio area normalization approach.Masked face detection and recognition system.Industrial surveillance, anomaly detection and object identification module.Efficient path-finding for emergency call management and real-time dashboard etc. |
| Mar 2021 - Present [Part Time] | Research Engineer <i>Visual Information Processing(VIP) Lab, MIST</i> <ul style="list-style-type: none">R&D on Computer Vision Applications, Human-computer Interaction, Traffic Surveillance.Mentoring young researchers and conducting technical sessions. |
| Jul 2020 – Feb 2021 | Vice President (Technical Activities) <i>MIST Robotics Club</i> <ul style="list-style-type: none">Mentored robotics enthusiasts on multiple projects' construction and implementation.Helped organizing the technical aspects of several national level robotics competitions. |

Education

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| Feb 2017 - Feb 2021 | Military Institute of Science and Technology, Bangladesh University of Professionals(Dhaka, Bangladesh) <i>B.Sc. in Electrical, Electronic and Communication Engineering</i> (Major: Communication , CGPA: 3.64/4.00) |
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Research Interests

• Data Science • Deep Learning • Machine Learning • Computer Vision • Robotics • Human Computer Interaction

Relevant Courses

• Calculus • Vector analysis, Matrices and Geometry • Complex Variables and Statistics • Computer Programming • Continuous Signals and Linear Systems • Digital Communication • Digital Signal Processing • Random Signals and Processes

Technical Skills & Certifications

- Coding Skills:** Python, R, SQL, Matlab, C, LaTeX
- Deep Learning & Computer-vision Packages:** Keras, TensorFlow, PyTorch, Scikit-Learn, Open-CV, Mediapipe, Dlib
- Data Processing, Visualization & Deployment:** Numpy, Pandas, Matplotlib, Seaborn, R Shiny, Leaflet, dplyr
- Machine Learning:** Regression, Classification, Convolutional Neural Network, Transfer Learning, Time Series
- Robotics:** Arduino, Raspberry Pi, PCB Designing, Sensors & Micro-controllers
- Selected Certifications:** TensorFlow Developer Certificate, Convolutional Neural Networks in TensorFlow, Crash Course on Python, Artificial Intelligence Foundations: Machine Learning, Intro to Deep Learning

Test Scores

Graduate Record Examination (GRE) - October 2021

Quantitative Reasoning: 156 | Verbal Reasoning: 147 | AWA: 3.5

The International English Language Testing System (IELTS) - November 2021

Listening: 8.5 | Reading: 8.0 | Speaking: 7.0 | Writing: 6.5 | Overall: 7.5

Academic Research Experience

Feb 2020 – Feb 2021 | **An undergraduate thesis on Demand Forecasting in Smart Grid Using Long Short-term Memory (LSTM)**
Supervisor: Dr. Kazi Abu Taher, Professor, Department of ICT, Bangladesh University of Professionals

Publications

- 2022 | 1. Chanda, D. & **Roy, K.** A Novel Approach on Facial Emotion Recognition using Landmark Distance Based Deep Neural Network in *International Conference on Advancement in Electrical and Electronic Engineering (ICAESEE)* [Under Review] (2022).
2. Onim, M. S. H., Nyeem, H. & **Roy, K.** BLPnet: A New DNN model for Automatic License Plate Detection with Bengali OCR in *Journal: Neurocomputing* [Under Review] (2022).
3. **Roy, K.** A Comprehensive Study on Different Machine Learning Techniques for Rainfall Forecasting in *International Conference on Advancement in Electrical and Electronic Engineering (ICAESEE)* [Under Review] (2022).
4. **Roy, K.** & Akif, M. A. H. Real Time Hand Gesture Based User Friendly Human Computer Interaction System in *International Conference on Innovations in Science, Engineering and Technology (ICISSET)* [Accepted] (2022).
5. **Roy, K.** & Chanda, D. A Robust Webcam-based Eye Gaze Estimation System for Human-Computer Interaction in *International Conference on Innovations in Science, Engineering and Technology (ICISSET)* [Accepted] (2022).
- 2021 | 6. Ishmam, A., Hasan, M., Onim, M. S. H. & **Roy, K.** Modelling Lips-State Detection Using CNN for Non-Verbal Communications in *The International Conference on 4th Industrial Revolution and Beyond (IC4IR)* [Accepted] (2021).
7. **Roy, K.**, Ishmam, A. & Taher, K. A. Demand Forecasting in Smart Grid Using Long Short-Term Memory in *2021 International Conference on Automation, Control and Mechatronics for Industry 4.0 (ACMI)* (2021), 1–5.
- 2020 | 8. Biswas, A. K., **Roy, K.** & Chakraborty, U. Investigation of a Four-element Textile Multiple Input Multiple Output Antenna for Ku-Band Applications in *2020 IEEE Region 10 Symposium (TENSYP)* (2020), 382–385.

Selected Projects & Research Works

Oct 2021 – Ongoing | **Cheating detection system for the online exam using time series anomaly detection**
July 2021 – Ongoing | **Webcam based real-time American Sign Language(ASL) detection using deep learning**
Jul 2020 – Sep 2020 | **Recognition of spoken digits using statistical modeling**
Feb 2020 – Apr 2020 | **Radar based industrial vehicular optimization and industrial safety enhancement**
Nov 2019 – Jan 2020 | **Automated alert system for safer operation of railway crossing**
Jul 2019 – Sep 2019 | **Intelligent irrigation system to improve agricultural output using IOT sensors**
Feb 2019 – May 2019 | **Integrated home-security, automation & surveillance with Raspberry Pi, sensors & webcam**
Aug 2018 – Oct 2018 | **Car parking management system automation and assistance**
Feb 2018 – May 2018 | **Automatic rain detector and windshield wiper system for self driving vehicles**
Dec 2017 – Feb 2018 | **Self-correcting dual axis solar panel for low income households**

Achievements and Other Credentials

2021 | **TensorFlow Developer Certificate** | Awarded By: TensorFlow.Org(Google) [See Credential]
2019 | **IEEE Conference Project Presentation: 1st Runner-up** | Awarded By: ICEEICT
2018 | **Winner, National Power and Energy Hackathon** | Awarded By: Ministry of Power, Energy and Mineral Resources (MPEMR)
2017 | **Recipient of Dean's List Scholarship for Outstanding Academic Results** | Awarded By: MIST
Rank-52, MIST Undergraduate Admission Test, 2016, among 9,000 students