OP-N27

An artificial intelligence-based evaluation of battery capacity under PV uncertainty in a rural area of Bangladesh

Biswas Rudra Jyoti Arka* and Sourv Chandra Roy

Department of Electrical and Electronic Engineering, Bangladesh University of Engineering and Technology

**Corresponding author email: biswas.rja@gmail.com; 1806078@eee.buet.ac.bd*

In this study, a comparative analysis between forecasting models for solar power generation and a battery management system from the perspective of Bangladesh's rural area is presented. The proposed system consists of a forecasting model to estimate the photovoltaic (PV) electricity generation and a battery management system to store and distribute the generated power. In the proposed system, the PV electricity generation has been forecasted using weather data and Global Horizontal Irradiation (GHI) data. Deep learning model Long Short-Term Memory (LSTM) and an Artificial Neural Network (ANN) model were used to forecast the electricity generation and the results were compared with the results from Support Vector Machine (SVM), K-nearest Neighbors (KNN) and Linear Regression Analysis models. The estimation of the power generation was used to model a small-scale battery management system consisting of PV integration, distribution system, and loads, designed to serve the requirements for PV power for an area on a particular day. The battery management system is integrated into the system so that the power can be supplied to the main grid and also the abundant power can be stored for use later. The system can supply the stored power to the grid when there is a low generation of PV power in that particular area for a particular day. The battery management system is designed in the MATLAB/Simulink environment.

OP-N28

Vision for Smart Bangladesh: Ship detection using image processing by artificial intelligence

Zobair Ibn Awal[1] and **Tasnim Tabassum Tusti**[2]*

[1]Department of Naval Architecture and Marine Engineering; Bangladesh University of Engineering and Technology

[2]Department of Naval Architecture and Offshore Engineering; Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU), Bangladesh

**Corresponding author email: tasnimtusti1299@gmail.com*

Bangladesh is embracing digitalisation to turn the nation into a technologically sophisticated society by 2041, and that ambitious vision comes with improving different sectors and adopting artificial intelligence (AI). This research focuses on AI-based image processing to detect ships in Bangladesh. Several AI techniques will be investigated, and their performances against ship recognition will be evaluated. Leveraging artificial intelligence (AI) and image processing for real-time ship detection presents numerous advantages and applications. AI algorithms enhance accuracy by recognising ship patterns and minimising false positives and negatives. Real-time monitoring capabilities enable swift responses to suspicious activities, contributing to improved maritime security. Automated ship detection streamlines operations, reducing reliance on manual monitoring and allowing personnel to focus on critical tasks. This efficiency leads to cost savings, particularly in vast maritime areas. Applications include maritime surveillance, search and rescue operations, environmental monitoring (e.g., detecting illegal activities like oil spills), port security, customs and border control, fishery management, defence, insurance risk assessment, and navigation. Development in this area significantly enhances the accuracy, efficiency, and security of maritime activities, making them invaluable tools in various domains.