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Modelling Weather Patterns and Solar PV systems for the Sizing of Standalone PV Battery Charging System

The department of physics and Engineering at the University of Zululand (UNIZULU) is located in the middle of rural Zululand with communities that need to supplement the national energy grid with alternative energy sources. Most of these communities are rural or semi-rural who mostly harness solar energy by using standalone Photovoltaic (PV) battery charging systems. The University in its endeavour to support the surrounding communities carries out research with the purpose to ease the financial burden of these communities by tapping into the intellect of the postgraduate students. Zululand boasts a subtropical climate with sufficient solar radiation available for more than nine months of the year. The focus of this project is twofold: to predict the seasonal solar radiation in Norther KwaZulu Natal especially in non-monitored areas, and to model solar PV arrays for the sizing of standalone battery charging systems with the focus on hot climate regions. Recently an Electronics research laboratory that hosts state of the art equipment was inaugurated at the institution. This lab supports the use of 4th Industrial Revolution (4IR) techniques such as artificial intelligence approaches to provide soft means of modelling the weather patterns and the PV systems. The study involves the understanding of the processes/ principles involved in the generation of electrical energy from Solar cells. It will then require the translation of this understanding into models that can be used to captured the essence of the weather patterns and their interaction with the PV systems. Putting together a soft model and finally a prototype will be a major part of the suggested study. The developed prototype instrument will then be tested for recommendation on performance and possible adoption.

Apply to be considered for a student ; award (Yes / No)?

yes

Level for award;(Hons, MSc, PhD, N/A)?

MSc

Consent on use of personal information: Abstract Submission

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