

Proposal for a Workshop at 2024 CHPC National Meeting.

- This year the workshops run on **Sunday** 1 December only.

Please provide the following information for the proposed short course or tutorial workshop. It is not necessary to fill in everything, complete as much as you can to help us evaluate the proposal.

Title of Workshop:			
Lecturer(s):	Name, Affiliation, Email Address		
	1. Mr. Phila Sibandze, University of Fort Hare, psibandze@ufh.ac.za		
	2. Dr. Kgabo Humphrey Thamaga, University of Fort Hare, kthamaga@ufh.ac.za		
	3. Dr. Gbenga Afuye, University of Fort Hare, gafuye@ufh.ac.za		
Description: <i>As will appear on the conference website and programme.</i>	This workshop will focus on the integration of geospatial datasets, and deep learning algorithms for real-time monitoring and forecasting of offshore wind energy. The session will cover the framework for data retrieval, pre-processing, integration of remotely sensed datasets and the development of predictive models to optimize wind turbine performance. After developing the predictive models, we will integrate climate scenarios to forecast the state of wind in real-time monitoring and near-future prediction. Participants will learn how to integrate cutting-edge geospatial, and meteorological datasets with deep learning algorithms to predict energy production. The workshop will provide valuable insights for renewable energy-related professionals and stakeholders on how geospatial data analytics and deep learning approach can transform the energy sector.		
Duration:	<input type="checkbox"/> ¼ day (90 min) <input checked="" type="checkbox"/> ½ day (3h) <input type="checkbox"/> full day (6h)	Size: (max number of delegates)	
Target Audience: <i>(who should attend this tutorial)</i>	This tutorial is intended for professionals, researchers, students and the public with interest on geospatial intelligence with particular focus in the fields of renewable energy. Participants who are interested in understanding how big data and deep learning techniques can improve wind energy in real-time, forecasting and grid management.		
<i>[If available, include or attach a list of names and email addresses of anyone who has already expressed interest in attending this tutorial or that the CHPC should specifically invite.]</i>			
Prerequisites: <i>(what previous knowledge or skills should the attendees have)</i>	Attendees should have basic knowledge of machine learning, geospatial data analysis, and an understanding of wind energy systems.		
Type of workshop:	A mix of lectures and practical's. Attendees will gain hands-on experience in implementing geospatial big data frameworks and predictive models.		
Special requirements: <i>(will the attendees need to bring a laptop; have access to the cluster, or specific software; etc.)</i>	Pre-installed Python, access to a cluster, and relevant deep learning libraries (TensorFlow, Keras, PyTorch)		

Timetable: Please provide an outline of full syllabus

Sunday (1 Dec 2024)

08:00 Registration

- 09:00 Presentation of the real-time monitoring and forecasting of offshore wind energy system
- Background
 - System design and architecture
 - Advantages of the integrated approach (Geospatial bigdata and Deep Learning)
 - Limitations of the system*
 - Recommendations*
- (* optional, we can leave this out)

10:30 Morning Refreshment Break

- 11:00 Practical demonstration of the system
- Technical specification of the system (The cortex hub will help in defining the appropriate system(s) that will take into account of the following.
 - Development environment
 - Model architecture (How the data retrieved from source and ingested in the system in real-time.
 - Preprocessing (Normalised for the model)
 - Training and validation
 - Classification and prediction
 - Front-end application development (mobile app and dashboard that will show the different meteorological parameters as they are ingested into the system in real-time and also show future projections of wind and related parameters.
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12:30 Lunch

13:30

15:00 Afternoon Refreshment Break

15:30

17:00 End of Day

For 90 minute workshop, only complete one session block; for a half-day workshop only fill in two session blocks. We cannot guarantee that your preferred session choice (morning or afternoon) will be available as we have to schedule the timetable according to available venues.

Additional Comments: