Power System Data Analytics

CENTRE FOR RENEWABLE & SUSTAINABLE ENERGY STUDIES

DATE 14 – 18 February 2022

VENUE K406, Knowledge Centre, Engineering Faculty, Stellenbosch University

ACCREDITATION

Certificate of attendance (4 CPD points) REGISTER HERE

Certificate of completion (4 CPD points) REGISTER HERE

15 academic credits at NQF 8 or 9 level READ MORE

DEADLINE Registration closes 14 calendar days before the course starts

The number of attendees is limited. Bookings will be taken on a first come, first served basis.

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PRESENTER

Dr Sydney Kasongo is a Data Science lecturer at Stellenbosch University in the Department of Industrial Engineering and the School for Data Science and Computational Thinking, South Africa. Furthermore, he is a published author in the following journals: IEEE Access, Computers & Security (Elsevier), ICT Express (Elsevier, won the ICT Express Best Paper Award 2021), Journal of Big Data (Springer).

PRESENTER

Prof Jacomine Grobler is a member of the Department of Industrial Engineering (IE) at Stellenbosch University. She specializes in optimisation algorithm development and data science. She spent seven years in industry before completing her PhD in 2015. She has since received a number of rewards including the 2017 South African Institute for IE Most Outstanding Young Industrial Engineering Researcher Award and regularly reviews papers for leading international journals.

Synopsis

An introduction to the data analytics life cycle, and how to apply each phase of this life cycle to solve power system data analytics problems, with specific reference to short-term forecasting of demand and renewable energy production.

Students will learn techniques for exploratory data analysis, and how to apply machine learning approaches for mining knowledge from data sets, to extract hidden patterns, associations and correlations from data. Students will gain the practical know-how needed to apply data analytics techniques to structured data. The advanced data analytics techniques encountered will be applied to data intensive engineering problems from the power systems domain.

As part of the modelling and evaluation phases of the data life cycle the following short-term demand and VRE production forecasting aspects will be covered in more detail:

- Introduction to power system operation - the need for forecasting
- Numerical Weather Prediction (NWP) models
- Weather processes and climate for South Africa
- Relationship between weather and load
- Relationship between weather and VRE production
- VRE energy conversion models
- Weather parameter measurement (data aspect)
- Short-term load forecasting
- Application of machine learning and big data techniques to short term VRE production forecasting

Qualification and accreditation

The module is accredited for a variety of outcomes, depending on what the attendee registers for. Module contact time (40 hours) are shared by all attendees, but additional assessments, assignments, and projects will be specific to the outcome that the attendee registered for.

- The module is accredited for ECSA Continuous Professional Development (CPD) credits, and attendees can obtain a certificate of attendance (if all lectures have been attended) or competence (if all lectures have been attended and various assessments have been successfully passed).
- The module is also accredited for 15 academic credits at both NQF8 level (Post-graduate diploma) and NQF9 level (Masters), as part of various academic programmes. This requires a total time investment of 150 hours.

Delivery Model

- The module will be delivered over five days. Pre- and post-module assignments and projects are applicable depending on the outcome the attendee registered for.
- A blended classroom/online model will be followed, with students being offered the options to attend in person (covid dependent), online only, or a mixture of these.

Who should attend

Engineers, technologists and technicians active in the energy sector. Government and local authority officials. Architects, planners and developers. Investors. Academic students.

Travel and Accommodation

All travel and accommodation arrangements are the attendee's own responsibility.

Prerequisites

Certificate of attendance: none
Certificate of competence / Post-graduate diploma at NQF8: NQF7 engineering qualification
Masters at NQF9: NQF8 engineering qualification
IT infrastructure: For online attendees, adequate internet connectivity to connect reliably via Teams for the duration of the module. For Certificate of competence, Diploma and Masters attendees, a computer capable of running Windows 10 with user rights to install new software.

Module Fees

- The standard fee for the five-day module is:
- **R12 000 for a certificate of attendance**, and
- **R14 000 for a certificate of competence**. Please refer to the University's latest study cost information for academic fees.
- Attendees from Eskom, municipalities, government, academia and industry that are actively involved in some aspect of the South African power system may apply for a **50% CPD fee reduction**.
- Cancellations made up to 21 days before the module starts will be subject to a 15% handling fee. No refunds will be made after this date; however, substitutions will be accepted.
- Payment is mandatory for attendance.
- In the case of unforeseen circumstances, Stellenbosch University reserves the right to cancel the module or change the presenter/s, in which case all fees will be reimbursed in full on request.

Contact

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