

Is there scope for a smart mini grid in Botswana?

Development of community-based grid in villages Rural villages in Botswana remains poorly electrified. Given the scope and success of the PV systems, there is huge scope for forming a SMART Mini Grid -based electrification. These Smart Mini Grids could include smart futures after practical considerations.

What are the challenges of smart grid in Botswana?

As Botswana gears up for investment in the Smart Grid technology hugely to meet its growing energy demand in the country, with the transition from analogous to digital electricity, there are numerous infrastructure challenges associated with it. One of the key challenges is in communication.

What is smart grid VPP in Botswana?

Smart Grid VPP model is an emerging technology in Sub-Saharan Africa as compared to other nations across the globe. There are inherent challenges in the smart grids. These challenges need to be taken into account when implementing and deploying smart technologies in Botswana.

How will smart grid--virtual power plant change the business model?

Since Smart Grid--Virtual Power Plant has got the potential to change the business model of electricity generation, it will dictate on where, when and how energy is produced. In this scenario, every household and business will be a prosumer as well as a consumer since they will act as small micro generators.

What are the benefits of village connected VPP in Botswana?

The assurance on the sustainable income will be from selling the excess produced electricity back to the grid through the village connected VPP. This will also enhance and strengthen the bond among the communities since their livelihood will depend on the energy from community grid. Fig. 7. Smart mini grid model for rural villagers in Botswana.

What is data access and ownership in the smart grid?

Another critical element related to data access and ownership in the smart grid is data privacy. Since it is closely related to internet resources, it is essential that the privacy of the consumer or prosumer, in this case, is respected. This raises a fundamental question as to how safe the data is to the prying eyes of others.

grid topology. Bolognani et al. [10], Peppanen et al. [11], and Liao et al. [12] utilise the statistical correlation of single-phase voltages collected from smart meters to estimate distribution grid ...

For distribution grid topology identification, many methods have been proposed in recent years. For example, in [], the correct topology is searched from a set of possible radial networks. Given the line parameters, Cavraro et al. [] and Sharon et al. [] propose maximum-likelihood methods to select the operational distribution grid topology. Bolognani et al. [], Peppanen et al. [], and Liao ...

Matlabhelpers demonstrate how to use the MATLAB software for simulation of a smart grid. The smart grid is the integration of computing and communication technologies into a power grid with the goal of enabling real-time control and a reliable, secure, and efficient energy system.

Covert data attacks on the network topology of a smart grid is considered. In a so-called man-in-the-middle attack, an adversary alters data from certain meters and network switches to mislead the control center with an incorrect network topology while avoiding detections by the control center. A necessary and sufficient condition for the ...

The communication topology change of the smart grid was modeled by defining a time-varying communication topology matrix. This communication topology matrix enables to build a closed ...

Cyber attacks on a smart grid aiming at misleading the control center with incorrect topology information are considered, and an undetectable attack that requires the modification of only a few meter data is proposed. Cyber attacks on a smart grid aiming at misleading the control center with incorrect topology information are considered. In such ...

On Topology Attack of a Smart Grid Jinsub Kim and Lang Tong School of Electrical and Computer Engineering Cornell University, Ithaca, NY 14853. Email: {jk752, lt35}@cornell Abstract--Cyber attacks on a smart grid aiming at mislead-ing the control center with incorrect topology information are considered.

topology attack detection [20], [35] and some focused on developing defense against topology attacks [23]-[25] and mitigating the impact of topology noise in GNNs [26]-[28]. In power systems, the works presented in [15], [16], [29]- [32] studied the effects of topology noise and attacks on various functions, such as SE and cyber stress ...

Grid-Interop Forum 2011 Understanding Wireless Topologies for Smart Grid Applications Joaquin Silva . On-Ramp Wireless 10920 Via Frontera, Suite 200 San Diego, CA 92127 . joaquin.silva@onrampwireless . Keywords: smart grid, smart grid standards, wireless mesh, star topology, utility . Abstract . As smart grid standards are developed and deployed

$v_i(t), i = 1, \dots, T$  and a partially known grid topology, as shown in Fig. 1 o Find: the local grid topology  $E_{in}$  the dashed box in Fig. 1 III. INFORMATION THEORY-BASED TOPOLOGY ...

DOI: 10.1109/SmartGridComm.2016.7778817 Corpus ID: 31736485; Estimation of smart grid topology using SCADA measurements @article{Anwar2016EstimationOS, title={Estimation of smart grid topology using SCADA measurements}, author={Adnan Anwar and Abdun Naser Mahmood and Mark R. Pickering}, journal={2016 IEEE International Conference on Smart ...

This paper proposes an efficient channel impulse response (CIR)-based technique to detect topology changes

in the power grid. The features of the proposed approach include the following aspects: (i) it is a software-only solution, not requiring any intervention on the current smart grid architecture; (ii) topology changes can be detected via a simple distributed ...

Smart grid (SG) technology transforms the traditional power grid from a single-layer physical system to a cyber-physical network that includes a second layer of information. Collecting, ...

This paper develops an efficient solution for power network topology identification and monitoring activities in SG by exploiting the concentration of nonzero elements in the corresponding sparse vectors around the main diagonal in the nodal admittance or structure matrix of the PN. Smart grid (SG) technology reshapes the traditional power grid into a ...

like) topology, which can be modified by changing breaker statuses on available lines [54]. In recent years, the growth of behind-the-meter distributed energy resources (DERs) and smart loads (e.g., air-conditioners, storage devices, electric vehicles) have brought distribution grids to the forefront of smart grid advancement [85].

Download scientific diagram | Smart grid communication network topology at NAN/FAN/WAN. CRSN, cognitive radio sensor network; TVBD, TV band device; TVWS, TV white space; WASA, wide area ...

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