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Jinyue Yan, PhD

Editor-in-Chief, Applied Energy

Royal Institute of Technology, Stockholm, and Mälardalen University, Västerås, Sweden

Applied Energy

Please find enclosed our manuscript entitled as “An automated formal synthesis optimization method for sizing of stand-alone solar photovoltaic systems: case studies and comparative” by Alessandro Trindade (from Federal University of Amazonas) and Lucas Cordeiro (from The University of Manchester) which we would like to submit for publication in the Applied Energy journal. In our point of view, our work is aligned with two aspects covered by the Applied Energy journal: analysis and optimization of energy processes, and sustainable energy systems; and that is the reason that we are submitting it to this reputed journal.

At the following four paragraphs, we tray to demonstrate the novelty of the paper and why the Applied Energy should publish it.

The present work, a research paper (full length article), describes and evaluates an automated formal synthesis optimization method for sizing of stand-alone solar photovoltaic systems, which employs automated verification tool and computer science synthesis method to obtain the optimal sizing of the renewable energy system used in rural areas of developing countries or where grid extension is unfeasible.

The optimization of PV systems is usually performed by simulation tools, which are well known in the market. However, the exploration of all design space state is impossible with those tools, and some flaws (like over sizing) or incompleteness can be originated from the design phase, reaching the field, after the PV deployment. This can cause dissatisfaction to the PV system owners, and to the wrong conclusion that intermittent renewable systems are not good or reliable.

In our study, experimental results, from seven case studies, in a comparative evaluation of tools, showed that only the automated synthesis optimization can find detailed information for the PV systems, and with the plus of working with a data base of manufacturers and equipment that are available at the dweller market.

Finally, based on the fact that only since 2015 papers are dealing with formal verification applied to electrical systems, with excellent results, but only related to PV panels or to grid-tied systems, our study is unique and complemented with real data from nine months of use of four case studies: putting together mathematical models, automated verification, synthesis, simulation, empirical observation and interview from dwellers in remote communities of Amazon State in Brazil.

The authors claim that none of the material in the mentioned paper has been published or is under consideration for publication elsewhere. This paper is linked with the PhD Thesis from the main author, however the Thesis was not finished or defended yet.

As a list of recommended reviewers, with related research and papers at the same theme, we can indicate:

* Professor Alessandro Abate, from the Department of Computer Science of the University of Oxford (contact: [aabate@cs.ox.ac.uk)](mailto:aabate@cs.ox.ac.uk))
* Enrico Tronci, from Dip.to di Informatica Università degli Studi di Roma, “La Sapienza”, Italy (contact: [tronci@di.uniroma1.it)](mailto:tronci@di.uniroma1.it))
* Mimmo Parente, from Dip.to Scienze Statististiche & Innovation Systems (DISA-MIS), Università degli Studi di Salerno, Italy (contact: parente@unisa.it)

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Worth to mention that there is not conflict of interest, and that all the funding and the support received ended in March of 2019 (except the license support, that will stand until the end of 2019).

Thank you for your time.

Sincerely,

