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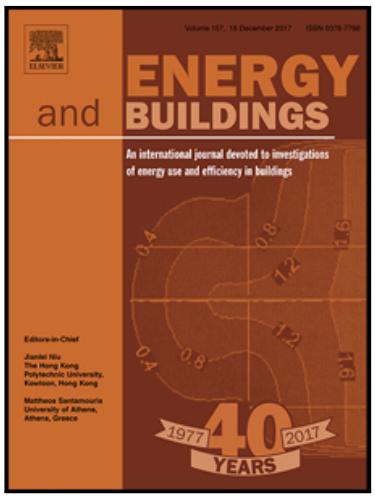

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Simon Henriet, Umut Şimşekli, Benoit Fuentes, Gaël Richard

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A Generative Model for Non-Intrusive Load Monitoring in Commercial Buildings

Simon Henriet[a,b], Umut Şimşekli[a], Benoit Fuentes[b], Gaël Richard[a]

[a] *LTCI, Télécom Paristech, Université Paris Saclay, Paris, France*
[b] *Smart Impulse, Paris, France*

Abstract

In the recent years, there has been an increasing academic and industrial interest for analyzing the electrical consumption of commercial buildings. Whilst having similarities with the Non Intrusive Load Monitoring (NILM) tasks for residential buildings, the nature of the signals that are collected from large commercial buildings introduces additional difficulties to the NILM research causing existing NILM approaches to fail. On the other hand, the amount of publicly available datasets collected from commercial buildings is very limited, which makes the NILM research even more challenging for this type of large buildings. In this study, we aim at addressing these issues. We first present an extensive statistical analysis of both commercial and residential measurements from public and private datasets and show important differences. Secondly, we develop an algorithm for generating synthetic current data based on a modelization of the current flowing through an electrical device. We then demonstrate that our electrical device model fits well real measurements and that our simulations are realistic by using the quantitative metrics described in the previous section. Finally, to encourage research

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