Journal of Telecommunications System & Management

Abstract

A-SHNILM-A Data-Based Analysis of Super-State Hidden Markov Models in Non-Intrusive Load Monitoring

Arooj Arif

University of Engineering and Technology, LHE54000, Pakistan

Abstract:

The Energy Crisis is costing economies worldwide and depleting natural resources at an alarming rate. Conservation of energy has become a point of concern particularly in large consumption sectors. Load monitoring is an effective solution to conserve electrical energy at a large-scale, cost-effectively. While many Non-intrusive Load Disaggregation techniques are in practice, some techniques have been known to outperform others. This paper discusses the most optimum unsupervised learning technique for load disaggregation in Non-intrusive Load Monitoring for Type-I and Type-II loads; catering to factors such as residential requirements, practicality in real time, ease of integration, scalability, feature extraction, reduced training and increased accuracy to meet the need of the time. A review of various implemented models of 'Super-State Hidden Markov Models' in NILM has been provided, to conclude that this methodology is the most efficient approach to load disaggregation in the provided case scenario that prevails on a large scale. A comparison with recent state-of-the-art work has also been provided to show that this approach out performs conventional approaches in terms of the above-mentioned factors (catered to by super-state HMMs).

Index terms- Non-intrusive Load Monitoring, unsupervised learning, Type-I loads, Type-II loads, super-state Hidden Markov Models.

Biography:

Arooj Arif is a final-year student at the Department of

Electrical Engineering at University of Engineering and Technology, Lahore, Pakistan. Her fields of interest are Machine Learning, Electro-Magnetism and Architecture. She has extra-curricular work and community service in her credit. She has one conference publication as co-author.

Publication of speakers:

1. Arooj Arif, Mechanical and thermal properties of carboxymethyl fibers (CMF)/PVA based nanocomposite membranes, Journal of Industrial and Engineering Chemistry, Volume 90, 25 October 2020, Pages 122-131
2. Gust, H., Kühnberger, K. U., & Schmid, U. (2006). Metaphors and heuristic-driven theory projection (HDTP). Theoretical Computer Science, 354, 98-117.
3. Harel, D., & Feldman, A. (2004). Algorithmics: The spirit of computing (3rd ed.). Harlow, New York: Addison Wesley.
4. Holenstein, E. (1972). Phänomenologie der Assoziation. The Hague: Martinus Nijhoff

International Conference on Automation and Artificial Intelligence | May 21, 2020 | London, UK

Citation: Arooj Arif; A-SHNILM-A Data-Based Analysis of Super-State Hidden Markov Models in Non-Intrusive Load Monitoring; Artificial Intelligence 2020; May 21, 2020; London, UK