Data mining and parallel computing for energy consumption forecasts in residential buildings

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Abstract

The energy consumption of a building has, in recent years, become a determining factor during its design and construction. With carbon footprints being a growing issue, it is important that buildings be optimized for energy conservation and CO_2 reduction. For this purpose, several models for the prediction of energy consumption can be used, including: engineering methods, statistical methods, artificial intelligence methods, artificial neural networks, support vector machines, etc. For some of these methods, a solution of a large linear system of equations is required.
In this paper we propose a new method based on a domain decomposition approach to solve such large problems. After showing the principles of this method, the algorithm and its parallel implementation are presented and extended to large scale simulation on parallel architectures. Numerical experiments on residential building illustrate the robustness, scalability and efficiency of this new parallel method.

Keywords: Data Mining, Machine Learning, Parallel Computing, Building Energy

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