# The adaptive spatio-temporal clustering method in classifying direct labor costs for the manufacturing industry

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| Abstract: | Employee productivity is critical to the profitability of not only the manufacturing industry. By capturing employee locations using recen advanced tracking devices, one can analyze and evaluate the time spent during a workday of each individual. However, over time, the quantity of the collected data becomes a burden, and decreases the capabilities of efficient classification of direct labor costs. However, the results obtained from performed experiments show that the existing clustering methods have failed to deliver satisfactory results b taking advantage of spatial data. In contrast to this, the adaptive spatio-temporal clustering (ASTC) method introduced in this paper utilizes both spatial and time data, as well as prior data concerning the position and working status of deployed machines inside a factory. The results show that our method outperforms the bucket of three well-known methods, namely DBSCAN, HDBSCAN and OPTICS. Moreover, in a series of experiments, we also validate the underlying assumptions and design of the ASTC method, as well as efficiency and scalability. The application of the method can help manufacturing companies analyze and evaluate employees, including the productive times of day and most productive locations. |
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