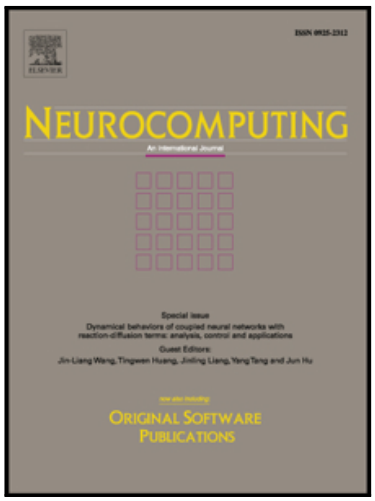

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Method of Predicting Human Mobility Patterns using Deep Learning

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Abstract

As human location and movement data are becoming easily accessible, owing to the prevalence of mobile devices, the use of such mobility data is gaining an increasing amount of interest. In our work, we establish a relationship between human mobility and personality, and attempt to model and predict movement patterns. Deep-neural-network and deep-belief-network models of deep learning are used in conjunction, for training the neural network. Both passive positioning information and active location information are used for the mobility information dataset, and the big five factors are used for the personality data. Both mobility information and personality information are split into training and verification groups, and are subsequently used to train and verify the neural network. The results are expressed in terms of hit ratios according to model factors comparing the predicted and observed values, and the parameters for the neural networks for the highest accuracy are identified. We use this optimal neural network to show the correlation between human personality and mobility patterns. Actual prediction is attempted, and is found meaningful in some conditions.

Keywords: Human Mobility Pattern, Mobility Pattern Prediction, Deep Neural Network, Deep Belief Network, Positioning Data, Location Data

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