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Posterior Regularized Conditional Random Fields

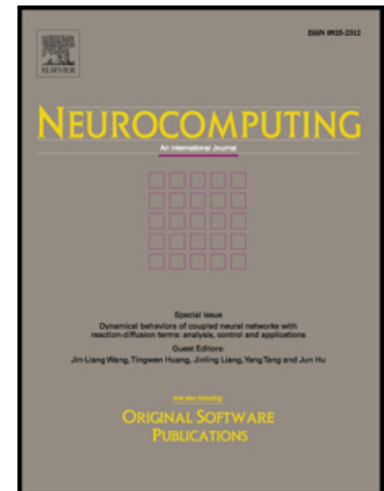
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Recognizing Activities from Partially Observed Streams using Posterior Regularized Conditional Random Fields

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Abstract

Recognizing activities from behavior data is important for comprehensively understanding human's intents and interests. However, in most cases, the user behaviors are partially observed or recorded, which make it a big challenge to model the user activities. In this paper, we propose to use a modified version of conditional random fields (CRF), the posterior regularized mixture conditional random fields (PRM-CRF), to learn and estimate the user activities from behavior streams. This model is able to incorporate both the contextual information and internal features of instances. Additionally, it uses a regularization term to integrate the prior domain knowledge, which reduces the negative influences caused by missing labels. Experiments on datasets of daily living activities and online social network activities demonstrate that the proposed algorithm is able to achieve competitive performance.

Keywords: Semi-supervised learning, Conditional random fields, Partial labelling, Posterior regularization, Activity recognition

1. Introduction

Behaviors such as clicking web pages on internet and browsing feeds on social networks are prevalent in people's everyday life. Mining patterns from the behavior data helps us better understanding users' interests and intents[1, 2, 3]. However, an important challenge is that most of these behaviors are partially observed or recorded, due to

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