Motivation-based Interest Recognition form Digital Phenotyping

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Abstract

We introduce a novel approach for detecting personal interests from daily behaviours. These behaviours and their features are derived from smartphone's data, a process known as digital phenotyping. Unlike traditional approaches of recognising interests that primarily rely on indicators such as frequency and duration of actions, our Motivation-based Interest Recognition (MIR) integrates behavioural knowledge into computational models. Doing so enables us to better identify actions of personal interests and differentiate them from obligations and similar actions.

1 Background

Human behaviours that are motivated by and indicative of personal interests can be utilised to personalise behavioural recommendations and promote health and well-being. Interests are typically predicted based on prior behaviour itself rather than the underlying motivations leading to those behaviours. This can be problematic because the person's behaviour might not necessarily reflect internally interesting actions (e.g. frequent visits to the city council). Therefore, we need an approach that differentiates between interests and obligations. The former describes intrinsically motivated behaviours, and their indicators can help differentiate them from the latter, which describes extrinsically motivated actions.

2 Introducing the MIR

In this work, interest determination is achieved by generating a measurement, the MIR score, for each participant behaviour over a given time period. This measure can be used to classify actions as intrinsically or extrinsically motivated, based on indicators of human motivation.

Specifically, we identify specific behavioural indicators that can be used to operationalise properties of two psychological models of human motivation: Self-Determination Theory (Ryan and Deci, 2017), and Maslow's Hierarchy of Needs (Maslow, 1943). We apply those measures to the behavioural events result from the smartphone's digital phenotyping to understand the underlying motivations and rank the prior behaviours accordingly. For example, if the extracted event is shopping, the rating produced from applying the measures of motivation properties would indicate how much a person is motivated by shopping. Higher ratings imply more internalised actions and, therefore a better chance of the person being intrinsically motivated.

To show the applicability of our approach, we instantiate our method with the smartphone's location data (Ibrahim et al., 2021). Our results indicate that our approach successfully identifies interests consistent with those reported by participants, matching or outperforming alternative approaches. We also see high inter-personal variation, suggesting a future role for personalisation in our approach.

References

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Maslow, A. H. 1943. *A theory of human motivation*. Psychological Review, 50(4), 370–396

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