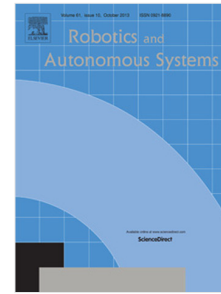


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Skill learning and action recognition by arc-length dynamic movement primitives

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Abstract

Effective robot programming by demonstration requires the availability of multiple demonstrations to learn about all relevant aspects of the demonstrated skill or task. Typically, a human teacher must demonstrate several variants of the desired task to generate a sufficient amount of data to reliably learn it. Here a problem often arises that there is a large variability in the speed of execution across human demonstrations. This can cause problems when multiple demonstrations are compared to extract the relevant information for learning. In this paper we propose an extension of dynamic movement primitives called *arc-length dynamic movement primitives*, where spatial and temporal components of motion are well separated. We show theoretically and experimentally that the proposed representation can be effectively applied for robot skill learning and action recognition even when there are large variations in the speed of demonstrated movements.

Keywords: programming by demonstration, skill learning, action recognition, dynamic movement primitives

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