

<p>題名</p>	<p>分散表現と神経力学系のダイナミクスに基づく手の行動推定 Estimation of Hand Motions Based on Distributed Representations and Neurodynamics</p>
<p>掲載雑誌</p>	<p>人工知能学会論文誌、Vol.32(2017)、No.1、p.A-G43_1-12</p>
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<p>概要</p>	<p>Dynamical systems, which are described using differential equations, present numerous benefits for time-series information processing. They can accommodate continuous changes and dynamic features. However, they are not good for processing complex spatiotemporal patterns such as a temporal order of motions. Therefore, they are often combined with symbol-processing systems or discrete-event systems to produce hybrid systems. As described herein, we propose a method of processing sequences of elementary motions based only on distributed representations and a neurodynamical system. To assess the method's possibilities, we constructed a human motion estimation system using a trajectory attractor model: a recurrent neural network with continuous-time dynamics. This system can deal analogically with novel hand and arm motions based on similarity between code patterns. Additionally, it can process complex sequences of motions in a robust manner because the network state is attracted to a long trajectory attractor formed in a series of subspaces corresponding to elementary motions. Then the network makes stable state transitions along the trajectory. Experimentally obtained results obtained from surface myoelectric signals show that the system estimated 15 complex hand and arm motions with average accuracy of about 86%, demonstrating the great potential of this system.</p>
<p>関連画像</p>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>図1: 提案する推定方法</p> </div> <div style="width: 45%;"> <p>図2: 複数動作からなる行動の推定過程</p> </div> </div>