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Paper Title: Mind to Motion: EEG-Based Classification of Motor Imagery and Actual Hand Movements Using LSTM Models

Authors: Thanate Angsuwatanakul, Apoorva Sunil Chakkamallisery, Sonam Tenzin Pelmo, Yutthana Pititeeraphab and Tasawan Puttasakul (Rangsit University, Thailand); Thapanee Khemanuwong (King Mongkut's Institute of Technology Ladkrabang, Thailand)

Email: thanate.a@rsu.ac.th

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## Abstract

This study presents an Electroencephalogram (EEG) based classification model tailored to discern between motor imagery and real motor actions. Additionally, the study investigates the efficacy of employing Long Short-Term Memory (LSTM) deep learning models for EEG signal analysis. The EEG analysis comprised two distinct phases, aimed at validating the hypothesis of distinguishing motor action from motor imagery. The proposed LSTM-based classification model exhibited a notable accuracy of 62.5% in discriminating motor action from motor imagery, and a promising 72.5% accuracy in distinguishing between resting state and motor action. These findings highlight the potential of EEG-based approaches in motor-related applications, thus providing auspicious avenues for the future development of brain-computer interfaces (BCIs) and motor rehabilitation technologies.

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