

Naturalistic behavior and its brain-wide neural correlates using B-SOiD

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For decades, neuroscience has focused almost exclusively on stereotyped, reductionist, and over-trained behaviors due to their ease of study - e.g. lever-pressing or reaching to a target. In contrast, naturalistic behavior provides a rich diversity of movements, but this feature also largely precludes it from quantification and use. Recent advances in computer vision have enabled automatic tracking of the position of body parts - but position is not behavior. To provide a bridge from positions to behaviors and their kinematics, we developed B-SOiD. This open-source method discovers natural spatiotemporal patterns in body position data, and then uses the cluster statistics to train a machine learning algorithm to classify behaviors that can generalize across subject and labs.

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