

# BBB seminar (BMED380)



Thursday, November 17, 14:30 at the BBB, Auditorium 4

## Cortical representation of 3D posture and behavior in posterior parietal cortex and beyond

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Neural population codes in sensory and motor cortices are dominated by signals generated by movement, but little is known of how such signals relate to natural actions animals express while behaving freely, outside the context of laboratory tasks. To gain a better quantitative understanding of how cortical activity maps onto natural 3D behavior, we recorded previously from the posterior parietal and frontal motor (M2) cortices, regions critical for motor planning and coordination, while performing high resolution motion capture of freely moving rats. This revealed dense neural encoding of precise 3D posture and movement of the head and back, with signals sufficiently strong to decode the animals' ongoing posture during spontaneous foraging. More recent, larger scale recordings across primary sensory and motor cortices revealed that neural encoding of posture and action are in fact universal features of dorsal cortical systems, including auditory, visual and somatosensory areas. Different regions encode different combinations of elementary features of pose and movement that could aid locally relevant sensory computations, such as movement subtraction in visual circuits, or sound localization in the auditory system. This work opens the door to future, quantitatively precise investigations of sensory and social processing in freely behaving subjects performing ethologically relevant tasks in more naturalistic settings.

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