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A New Rat-Compatible Robotic Framework for Spatial Navigation Behavioral Experiments

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Significance statement: We propose a novel robotic framework aimed at rodent spatial navigation experiments. We show that the robot can precisely follow predetermined or user-controlled trajectories, that rats can be trained to follow the robot on those same trajectories and that the robot is able to teach the rat in complex and large environments. We also show that CA1 place fields do not remap because of the robot. This framework could potentially be used to test novel hypotheses in ethologically realistic spatial environments and derive new training and task paradigms that may give further insight into the neural substrate of spatial navigation.
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