

### IS-3 A combination of Machine Learning and Cerebellar models for the Motor Control and Learning of a Modular Robot

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We scaled up a bio-inspired control architecture for the motor control and motor learning of a real modular robot. In our approach, the Locally Weighted Projection Regression algorithm (LWPR) and a cerebellar microcircuit coexist, forming a Unit Learning Machine. The LWPR optimizes the input space and learns the internal model of a single robot module to command the robot to follow a desired trajectory with its end-effector. The cerebellar microcircuit refines the LWPR output delivering corrective commands. We contrasted distinct cerebellar circuits including analytical models and spiking models implemented on the SpiNNaker platform, showing promising performance and robustness results.

