

2-009. Neurogym: An open resource to developing and sharing neuroscience tasks

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The evaluation of models in computational neuroscience would be greatly facilitated if a given model could be easily trained on a wide range of relevant tasks and compared to many experimental datasets through a variety of analysis methods. However, a major obstacle is the lack of a truly open exchange and easy access to tasks, datasets, and analyses. Towards such an open ecosystem, we are developing Neurogym, a community-driven collection of many neuroscience tasks. The main goal of Neurogym is to provide (1) a large number of modular and customizable tasks written in high-level readable code and with a common Python interface, and (2) ample support for subsequent model development and evaluation. Neurogym builds upon OpenAI Gym, the quintessential collection of reinforcement learning environments, and introduces several key features: (1) A high-level task constructor that allows users to easily build their own tasks and adapt existing ones; (2) A variety of tools called wrappers that allow users to easily assemble complex tasks using simpler ones as modules. (3) Support for training models using either Reinforcement (RL) or Supervised Learning (SL). One key objective of Neurogym is to facilitate the development of neural network models to be trained across many tasks and compared to experimental data. To achieve this goal, on the Neurogym website, we provide tutorial-style codes for training networks on each task. While Neurogym focuses on tasks, to support comparison with experimental data, we open sourced another codebase for efficiently comparing networks with data through a variety of analysis methods. Neurogym is maintained by a growing community of developers and users across the world. The core developers pledge long-term support to Neurogym in the hope of making it a dependable cornerstone of an open ecosystem of computational and systems neuroscience tools.