**Diversity:**

SCRIPTS:

To obtain the clusters of **Figure.5d** use the script *cluster\_movements\_cl.m* (see help therein). To obtain clusters of primitives as in **Figure.6a** use the script *cluster\_movements\_multiple\_time\_steps\_cl.m* (see help therein). To visualize the results in **Figure.6b,c** and **Supplementary Figure.7** use the script *estimate\_rate\_latency\_primitives\_cl.m*. Statistical tests for latency and rate are performed with kruskallwallis test. For the analysis on the impact of initial conditions on response clusters use the script *refine\_clustering\_cl.m* and *draw\_initial\_conditions\_cl.m* (see helps therein). Those scripts enable to generate all panels of **Figure.7**.

DATA:

Clustering results for **Figure.5d** can be found in *clustered\_response.mat*. The file *clustered\_prestimulus.mat* contains the cluster ID for initial conditions displayed in **Figure.7a**. The file *clusters\_VMM.mat* contains the clusters used for the analyses based on Variable-order Markov Chains. The file *export\_vomm\_results.xlsx* contains the decoding accuracy for the best 10 VMMs across a range of primitive durations.