

Table 1 Model hyperparameters that varied between models

Model	$g$	$h$	$M$	Nonlinearity	$\alpha$	$\beta$	$\gamma$	Multiple Delays
Regularized, monkey J ( <b>Figs. 1-7</b> , Supp. <b>Figures 1, 10, 11</b> )	1.5	1.0	7	rectified tanh	1e-4	0.03	1e-4	Yes
Regularized, monkey N (Supp. <b>Figures 1-7, 10, 11</b> )	1.5	1.0	8	rectified tanh	1e-4	0.01	5e-5	Yes
Complicated, monkey J ( <b>Figs. 1-7</b> , Supp. Figure 9)	3.75	1.0	7	rectified tanh	0	0	0	No
Complicated, monkey N (Supp. <b>Figures 1-7, 9</b> )	4.0	1.0	8	rectified tanh	0	0	0	No
Complicated to Regularized Study, monkey J (Regularized) ( <b>Fig. 8</b> )	2.7	1.5	7	tanh	4e-4	0	4e-5	No
Complicated to Regularized Study, monkey N (Regularized) (Supp. <b>Figure 8</b> )	2.8	1.5	8	tanh	4e-4	0	4e-5	No
Complicated to Regularized Study, monkey J (Complicated) ( <b>Fig. 8</b> )	2.7	1.5	7	tanh	0	0	0	No
Complicated to Regularized Study, monkey N (Complicated) (Supp. <b>Figure 8</b> )	2.8	1.5	8	tanh	0	0	0	No