

Supplementary Information

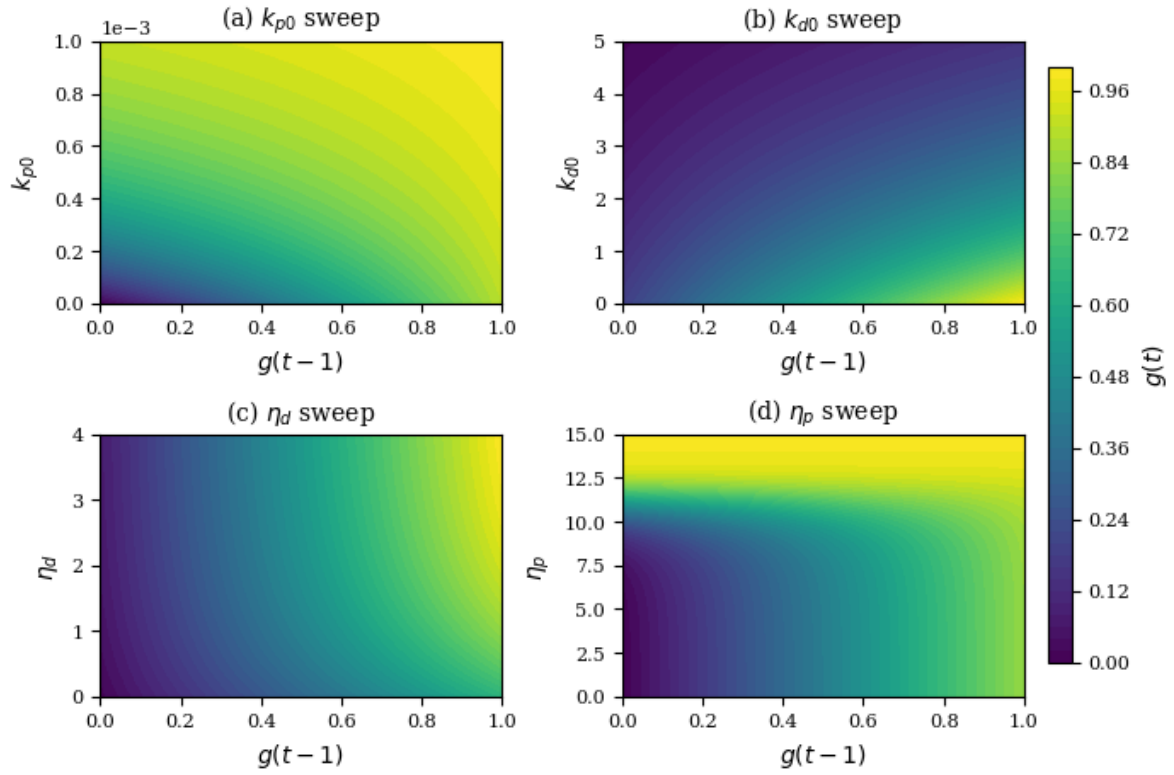
Adaptive Multi-Reservoir Neuromorphic Computing Using Memristive Nanowire Networks Enabled by Training-Induced Reservoir Diversity and Confidence-Guided Routing

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Supplementary Figure S1 | Parameter sweep. Classification performance as a function of (a) k_{p0} : potentiation coefficient, (b) k_{d0} : depression coefficient, (c) η_d : depression transition rate and (d) η_p : potentiation transition rate.

Training condition	200 NW only	350 NW only	500 NW only	Exactly one reservoir	Union of correct samples	Complementary expertise score	CES (%)
Shared training subset	0	0	1	1	180	0.0055	0.55
Non-overlapping training subsets	2	3	3	8	192	0.0417	4.17

Supplementary Table 1 | Complementary Expertise Score (CES) values

Reservoir A	Reservoir B	Training data	Cosine similarity
200 NW [0-999]	350 NW [0-999]	Same subset	0.9888 ± 0.0000
200 NW [0-999]	500 NW [0-999]	Same subset	0.9918 ± 0.0000
350 NW [0-999]	500 NW [0-999]	Same subset	0.9955 ± 0.0000
200 NW [0-999]	350 NW [1000-1999]	Different subset	0.4848 ± 0.1388
200 NW [0-999]	500 NW [2000-2999]	Different subset	0.4789 ± 0.1333
350 NW [1000-1999]	500 NW [2000-2999]	Different subset	0.4788 ± 0.1400

Supplementary Table 2 | Cosine similarity between reservoirs trained on a shared subset or non-overlapping subsets. Reservoirs are identified by their nanowire count and MNIST training-index range.

Parameter	Empirically selected value range	Selection Criteria
(a) k_{p0}	5×10^{-5} - 1.5×10^{-4}	Maximised classification accuracy while maintaining reservoir stability
(b) k_{d0}	0.5 – 1	Balanced convergence speed and temporal feature retention
(c) η_d	0.1 - 2	Prevented excessive weight adaptation and preserved network dynamics
(d) η_p	5 – 10	Improved feature separability without inducing instability

Supplementary Table 3 | Empirically determined parameter ranges from Supplementary Fig. S1