Supplementary Information

Ion-gating synaptic transistors with long-term synaptic weight modulation

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Figure S1. Changes in $I_D$ by applying $V_G$ pulses with different amplitudes (0.5 V, 1 V, 2 V) at the fixed pulse width (250 ms).
Figure S2. Cycle-to-cycle variation of (a) potentiation and (b) depression characteristics. 25 cycles of potentiation and depression are plotted.
Figure S3. Fitted curves for potentiation and depression of a synaptic transistor.
Figure S4. (a) Potentiation and depression characteristics during application of 64 consecutive identical positive $V_G$ pulses (9 V), then 64 consecutive negative $V_G$ pulses (-8 V). (b) Simulation of recognition accuracy for ANN that uses potentiation and depression obtained by pulses with identical amplitude.
Figure S5. Data retention properties of synaptic transistors with the threshold switch at 1st and 5th synaptic states after positive $V_G$ sweeps from 0 V to 2 V.