

Table of Contents

1 Introduction	2
2 Related Work	3-4
2.1 Unsupervised STDP-Based MNIST classification	3
2.2 Graphene-Based Synapses in SNNs	3-4
3 Graphene Device Implementation	4
4 Unsupervised Binary Pattern Classification	4-7
4.1 Neuron Model	4-5
4.2 Synapse Implementation	5
4.3 Network Architecture	5-6
4.4 Homeostatic Plasticity	6
4.5 Training and Classification	6-7
4.6 Single-Layer Network Results	7
5 Handwritten Digit Classification	7-11
5.1 Neuron Parameter Modification	7-8
5.2 Input Encoding	8-9
5.3 Training and Classification	9
5.4 Parameter Optimisation	9
5.5 Results	9-10
5.6 Comparison	10-11
6 Conclusion	11