List of Figures

2.1 Block diagram of multiple access types. 9
2.2 Illustration of interleaver and deinterleaver process. 12
2.3 All constellation points of two users transmitting simultaneously using BPSK symbols under AWGN channels. 13
2.4 BPSK Constellation for two-user NOMA. 15
2.5 Neural network structure. 18
2.6 Artificial neuron in neural network. 22
2.7 Plot of the $\tanh$ function. 23
2.8 Plot of the Softmax function. 23

3.1 Block diagram of uncoded NOMA with two users. 29
3.2 Block diagram of coded NOMA with two users. 30
3.3 Input and Output training variables of deep learning. 32
3.4 Deep learning model for uncoded scheme. 34
3.5 Deep learning model for coded scheme. 36

4.1 Training accuracy for uncoded scheme with $P_2 = 0.7$. 38
4.2 Training accuracy for uncoded scheme with $P_2 = 0.8$. 39
4.3 Training accuracy for uncoded scheme with $P_2 = 0.89$. 40
4.4 Training accuracy for coded scheme with $P_2 = 0.7$. 41
4.5 Training accuracy for coded scheme with $P_2 = 0.8$. 42
4.6 Training accuracy for coded scheme with $P_2 = 0.89$. 43
4.7 Performances of User 1 and 2 with some structure for $P_2 = 0.7$. 44
4.8 Performances of User 1 and 2 with some structure for $P_2 = 0.8$. 45
4.9 Performances of User 1 and 2 with some structure for $P_2 = 0.89$. 46
4.10 Performances of User 1 and 2 with some structure for $P_2 = 0.7$. 47
4.11 Performances of User 1 and 2 with some structure for $P_2 = 0.8$. 48

4.12 Performances of User 1 and 2 with some structure for $P_2 = 0.89$. 49
4.13 BER Performance of uncoded ISM and deep learning at $P2 = 0.7$. 50
4.14 BER Performance of uncoded ISM and deep learning at $P2 = 0.8$. 51
4.15 BER Performance of uncoded ISM and deep learning at $P2 = 0.89$. . . . 53
4.16 BER Performance of coded ISM and deep learning at $P2 = 0.7$. 54
4.17 BER Performance of coded ISM and deep learning at $P2 = 0.8$. 55
4.18 BER Performance of coded ISM and deep learning at $P2 = 0.89$. 56