CT-216 PROJECT

Introduction to Communication Systems

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Group - 3

Lab Group 5-6

Polar Codes

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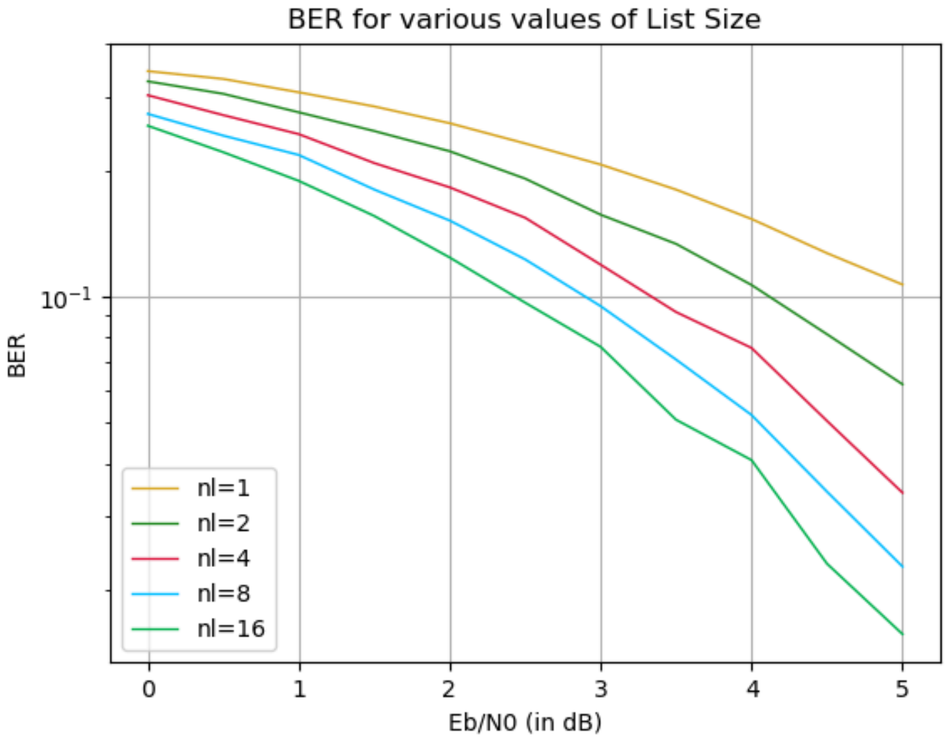
Graph comparing BER for different list sizes

Simulated



Research Paper (1)

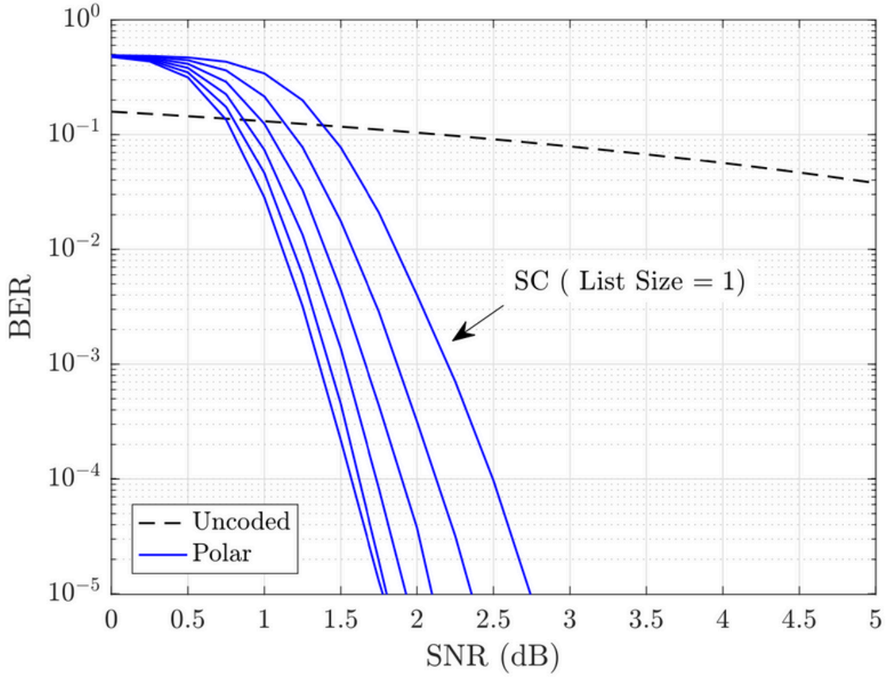
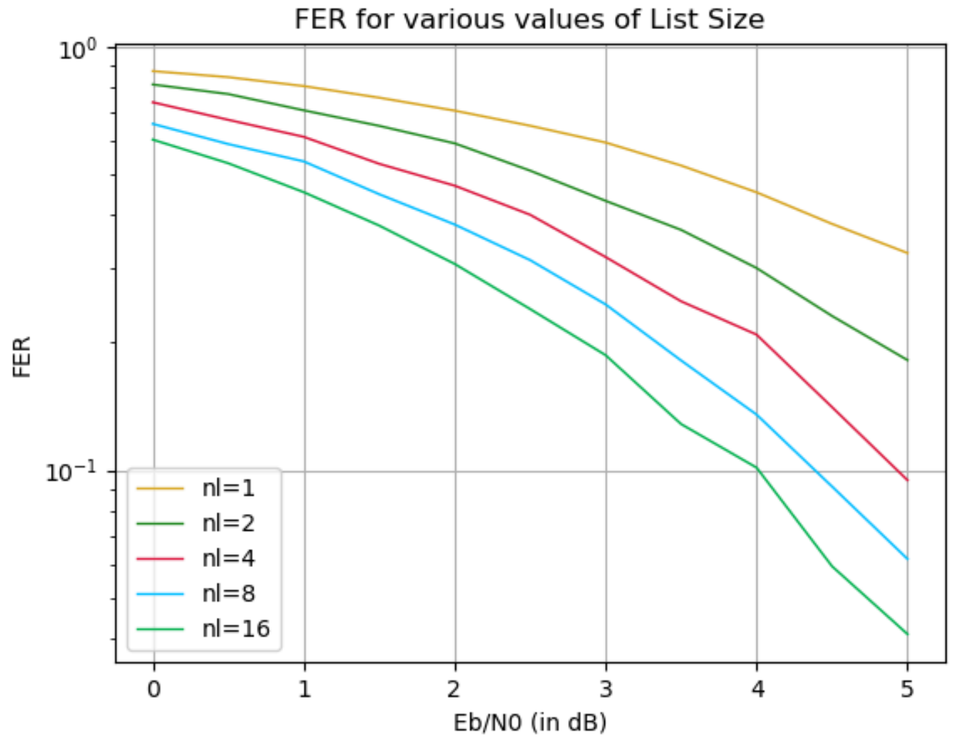


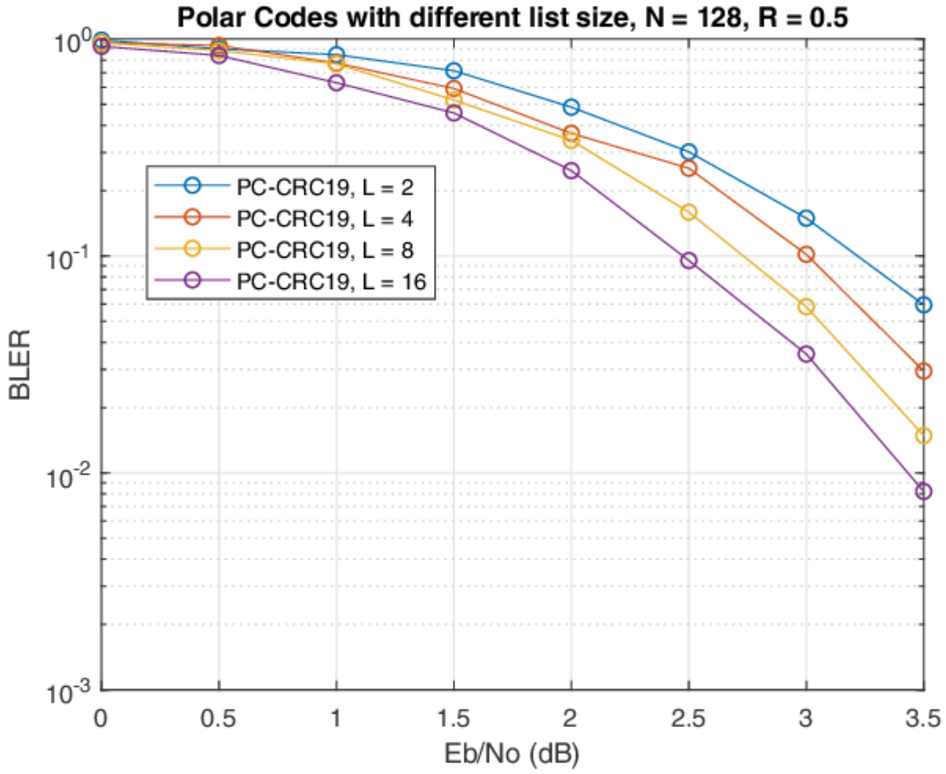
Figure 2.15: List-SC decoding for list sizes of $L = 32, 16, 8, 4, 2, 1$ from left to right, $N = 4096, R = 1/2$.

Graph comparing FER for different list sizes

Simulated

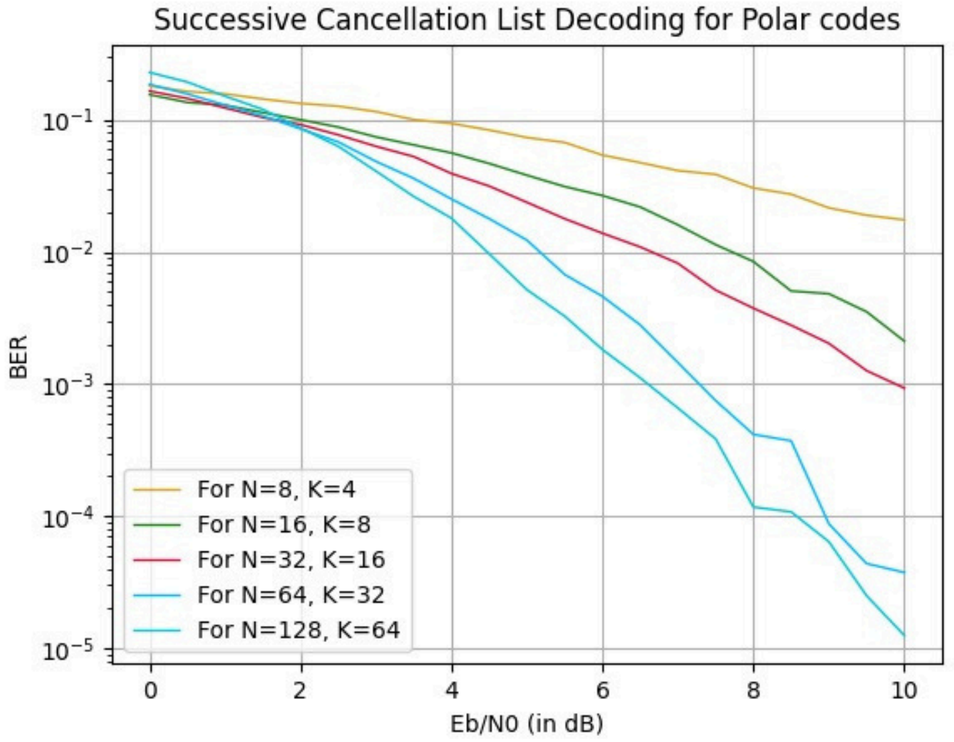


Research Paper (2)

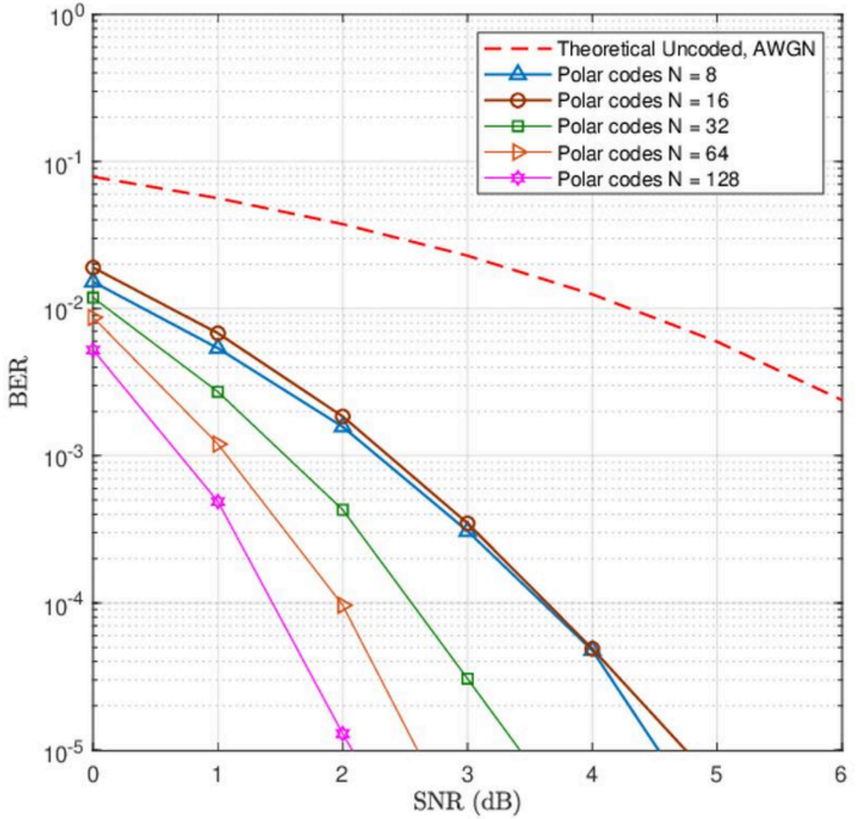


Graph comparing BER for different N at R=0.5

Simulated

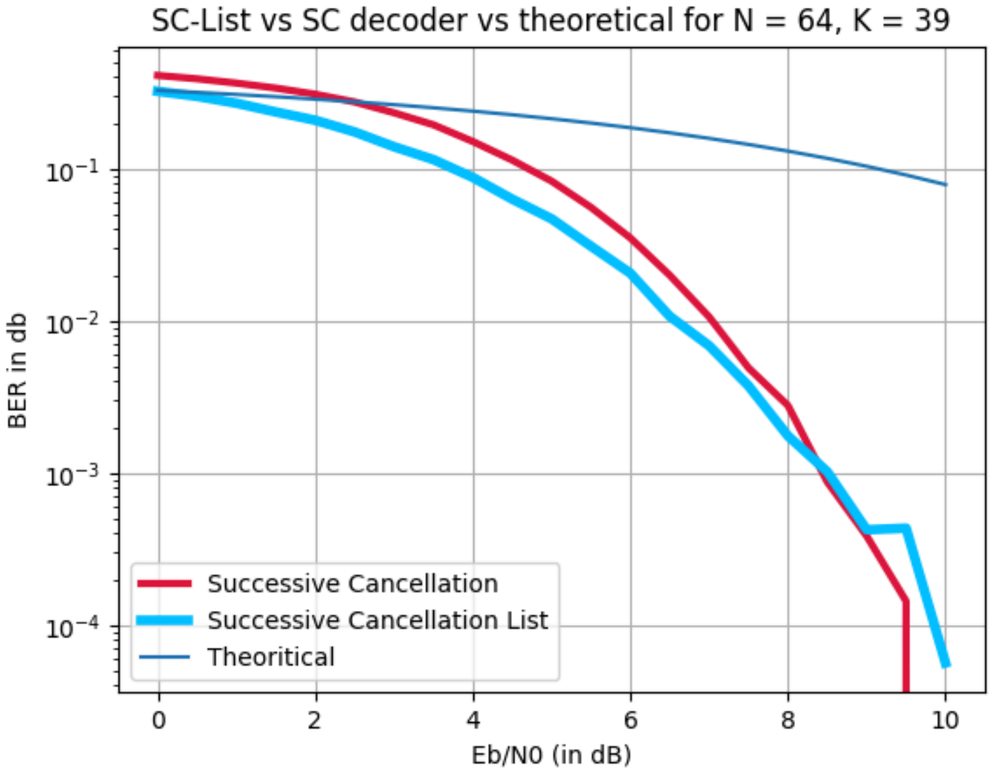


Research Paper (3)

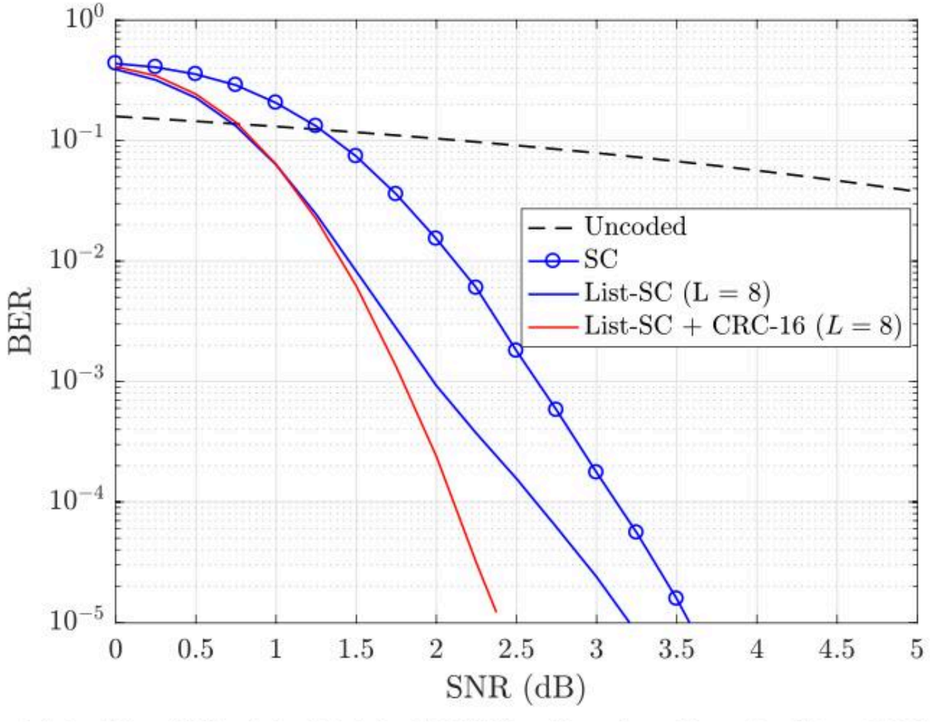


Graph comparing performance of SCL vs SC decoder

Simulated

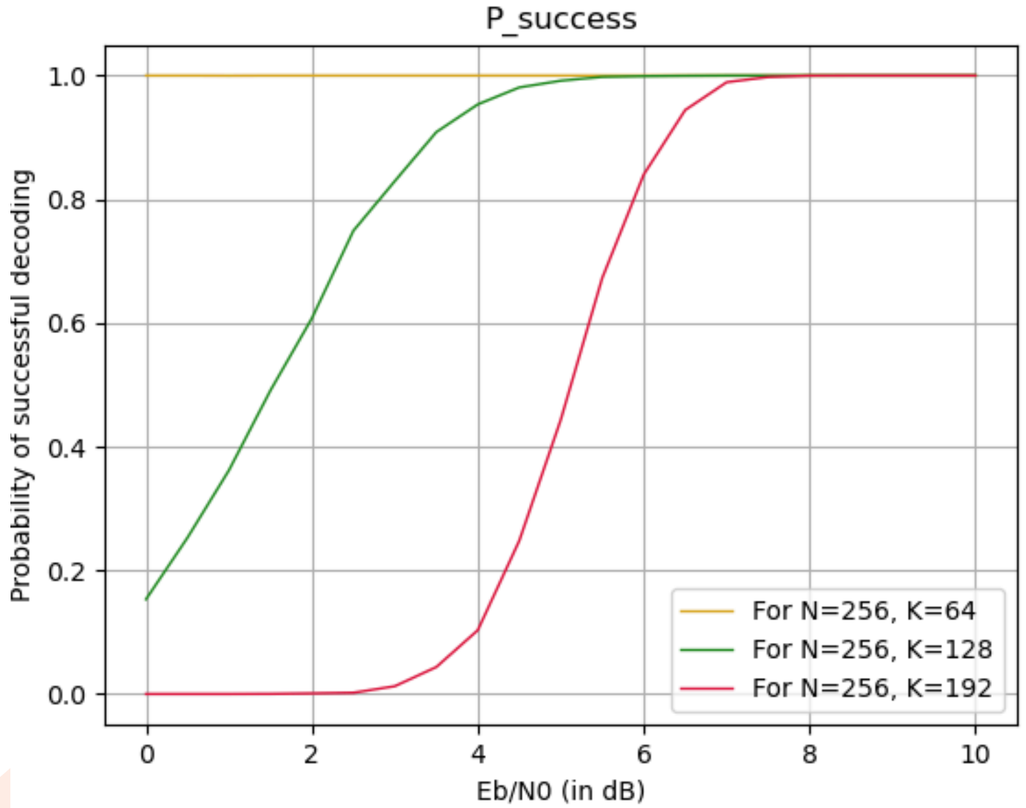


Research Paper (1)

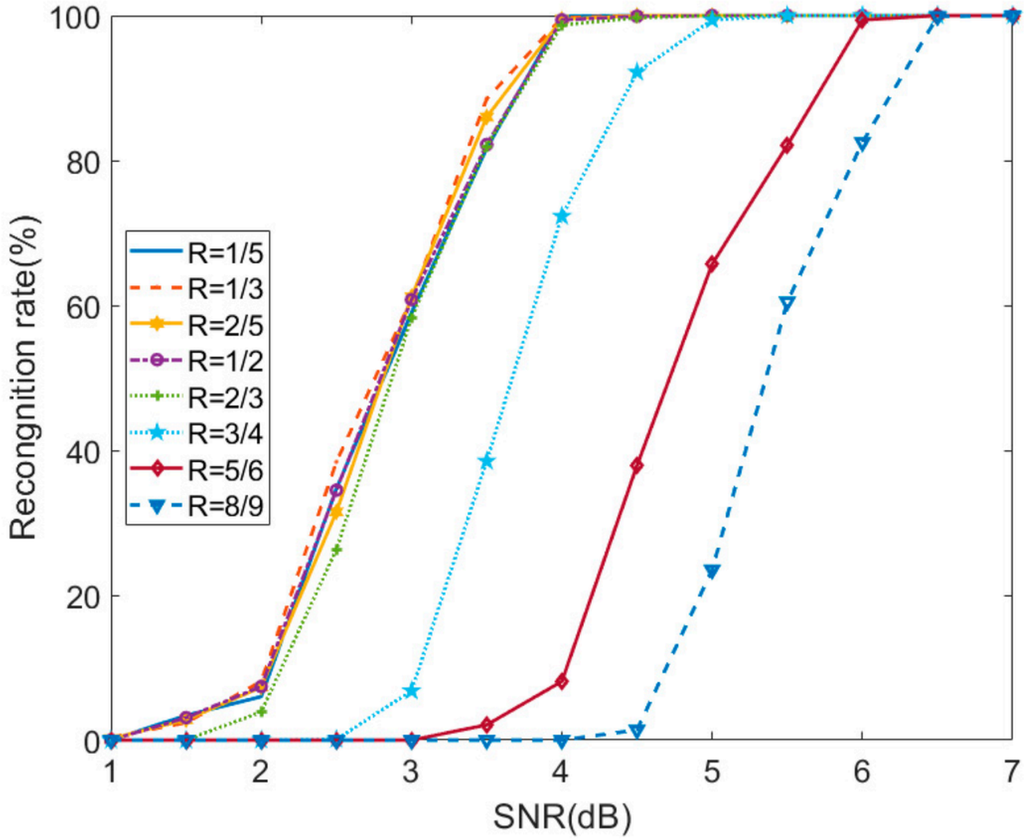


Graph for SCL at different values of R and N=256

Simulated

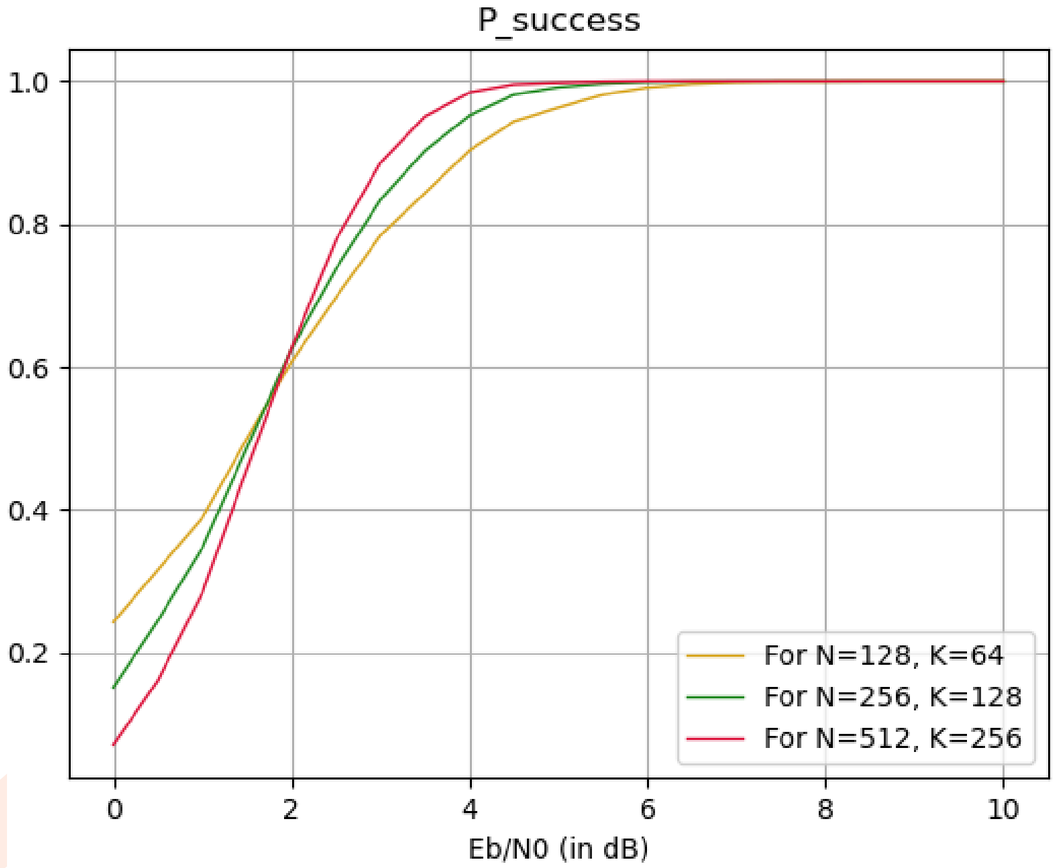


Research Paper (4)

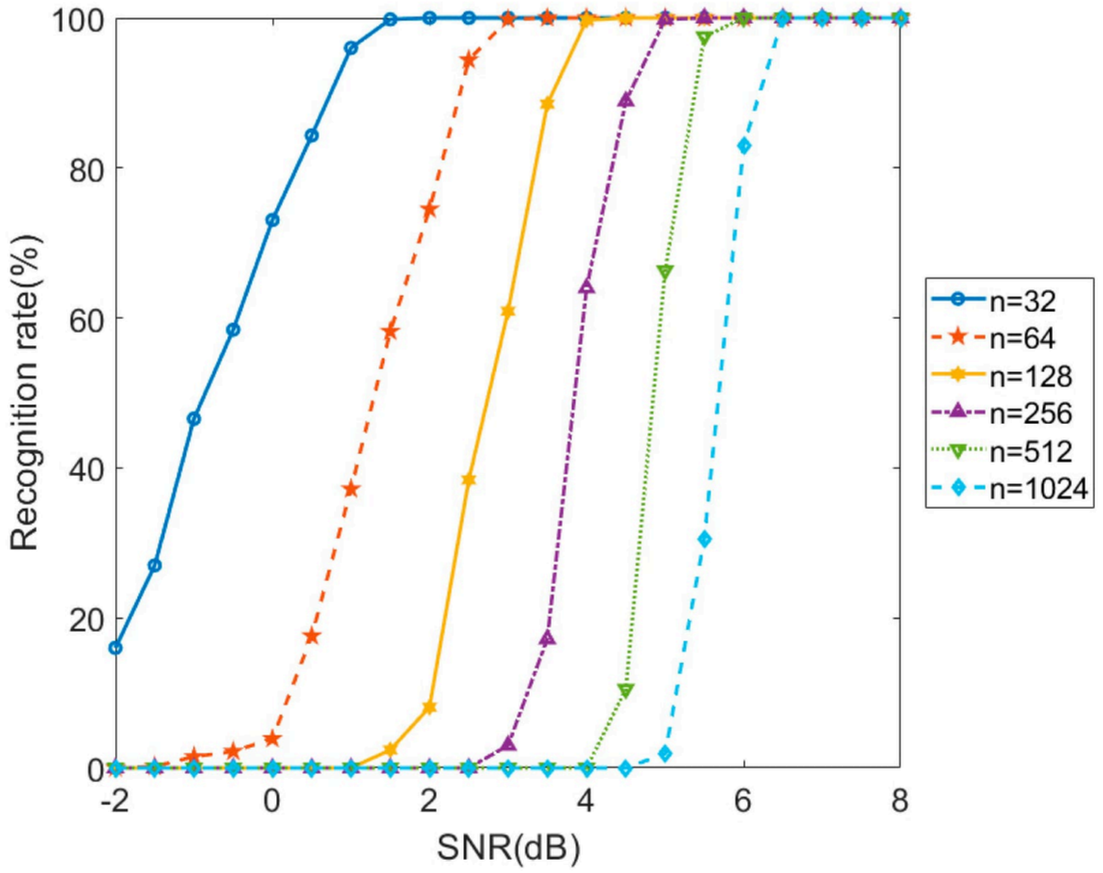


Graph for SCL at different values of N at R=0.5

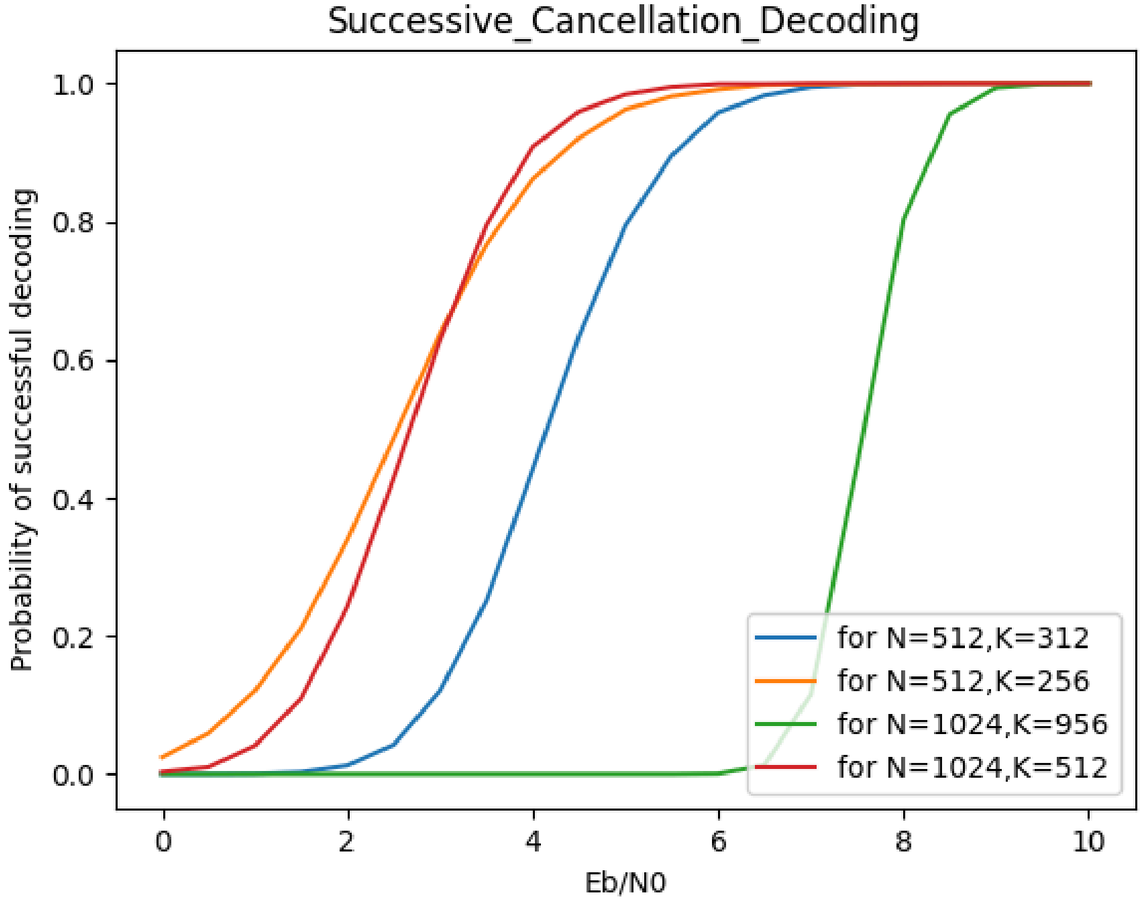
Simulated

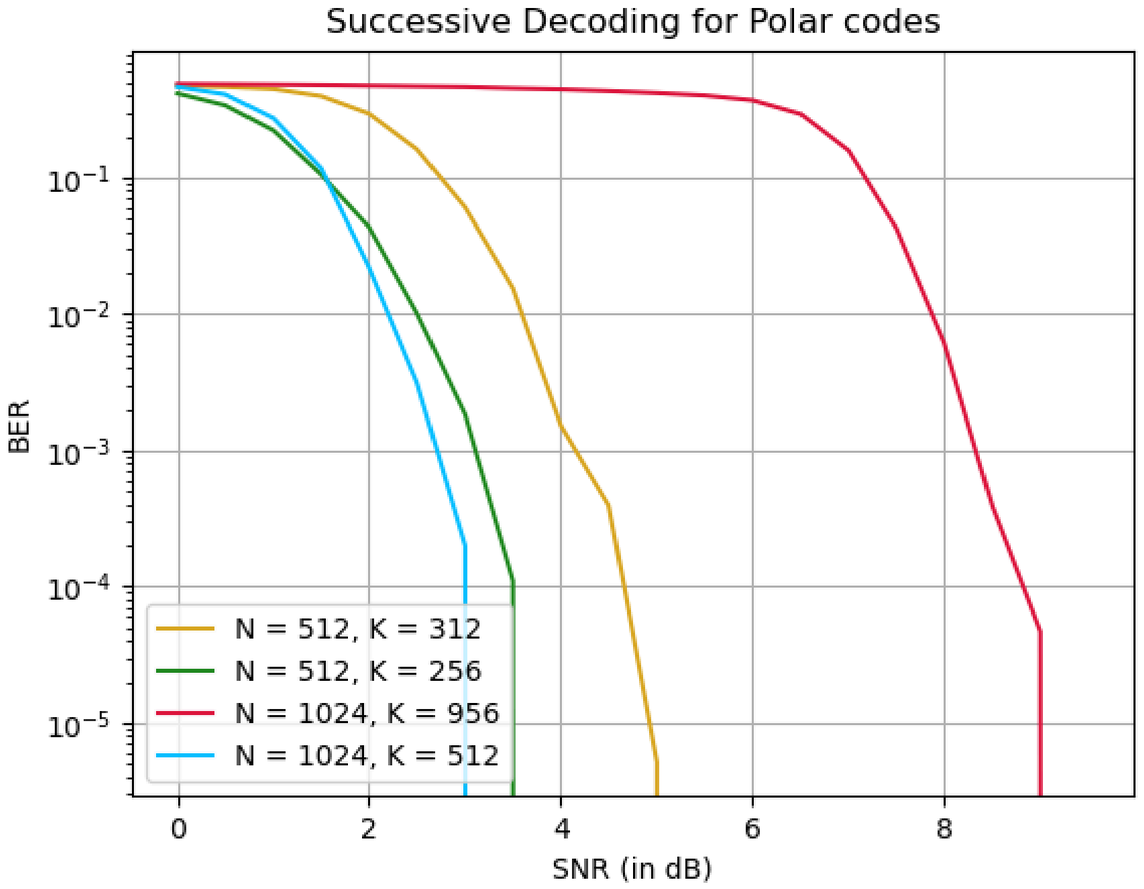


Research Paper (4)



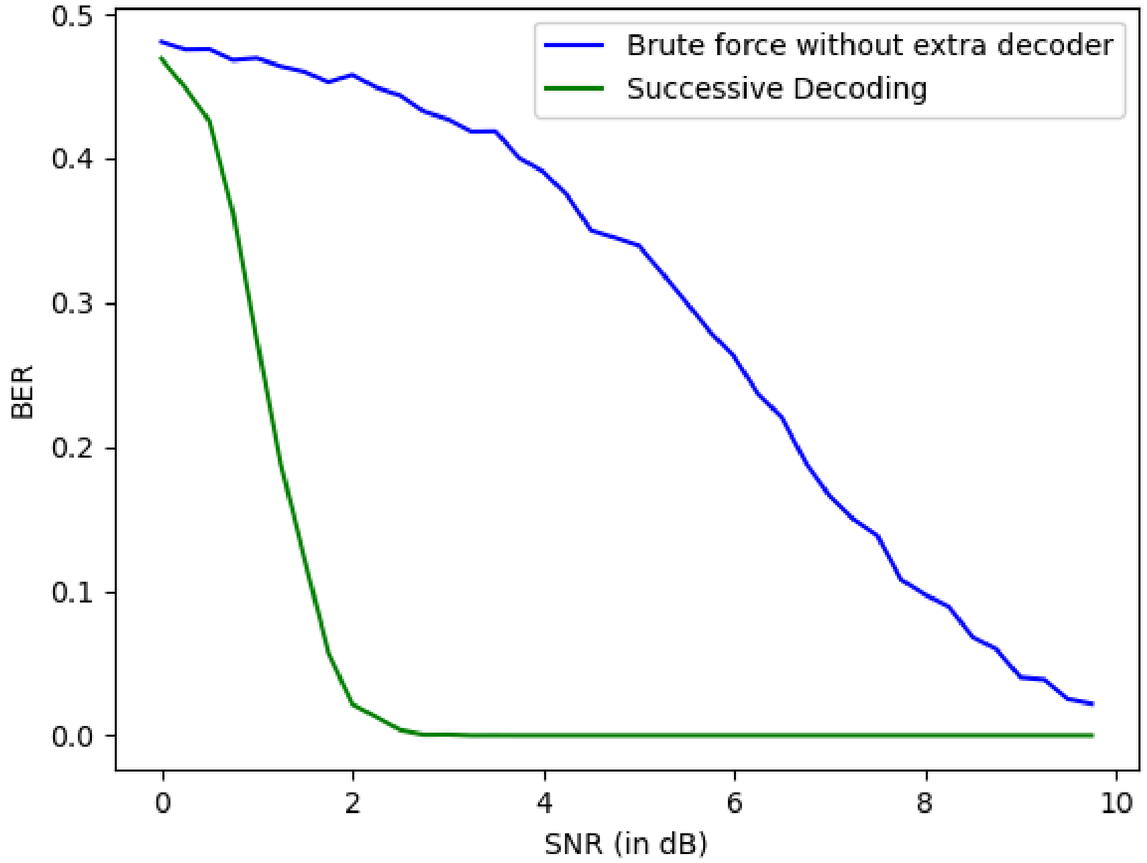
Additional Results for SC Decoder





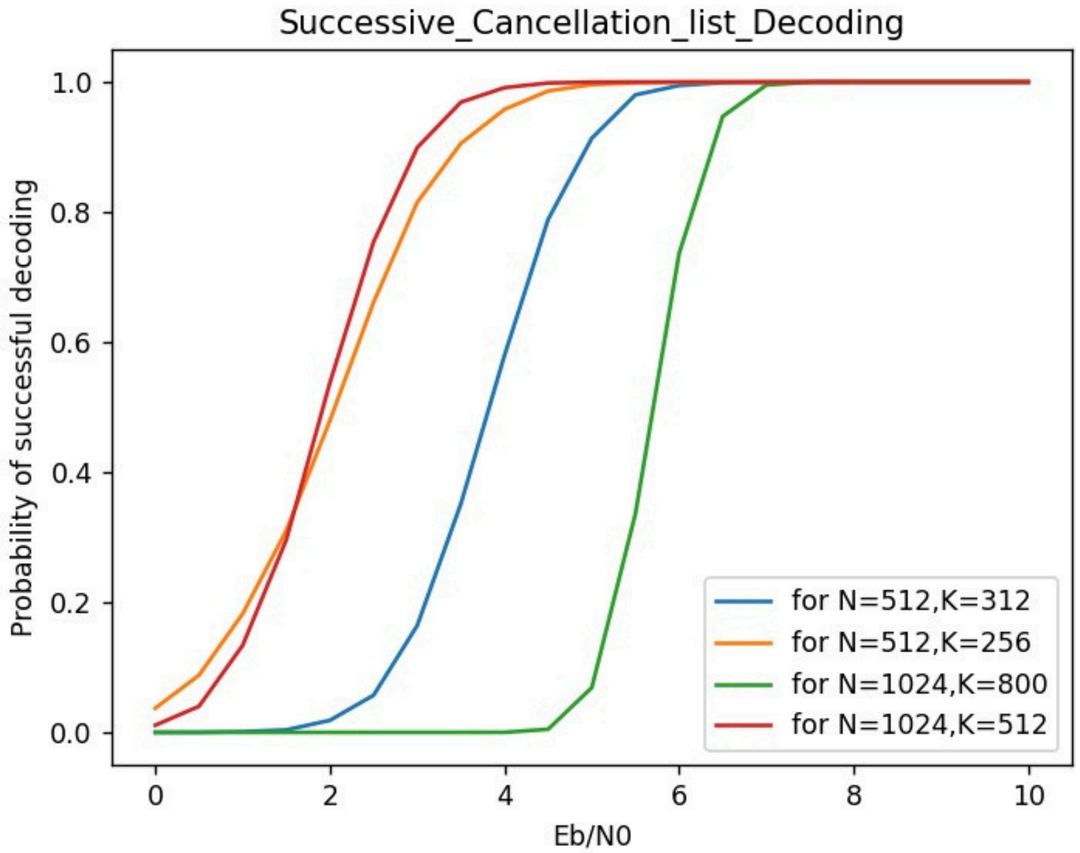
- At low SNR, P_Success is low / BER is high.
- At higher SNR, P_Success is high (reaches to 1)/ BER becomes quiet low

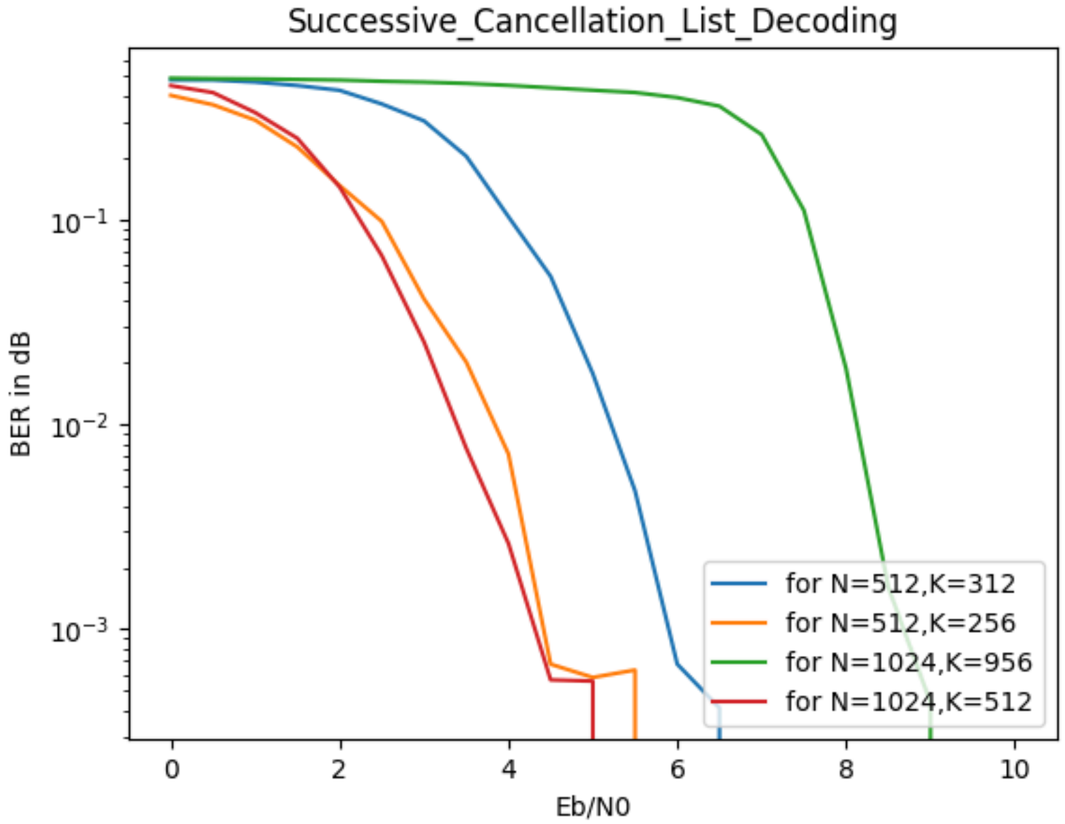
Additional Results for SC Decoder



Direct Demodulation vs Successive Decoding Technique

Additional Results for SCL Decoder





References

1) Construction and Performance of Polar Codes for Transmission over the AWGN Channel by Bashar Tahir.

2) Polar Codes Analysis of 5G Systems by Marwan Dhuheir.

3) Investigating Bhattacharyya Parameters for Short and Long Polar Codes in AWGN and Rayleigh Fading Channels

4) Polar Code Parameter Recognition Algorithm Based on Dual Space by Hengyan Liu, Zhaojun Wu, Limin Zhang, Wenjun Yan.

Thank you