

Forschungspraxis

# Investigation of polar and Reed-Muller codes under inactivation decoding for distributed computing

Recently, channel codes are proposed to speed up computation in distributed systems by introducing redundant calculations to avoid the latency due to, e.g., straggling nodes (see, e.g., [1]). Since this problem can be casted as coding for erasure channels (where the erasure probability itself might be a random variable), there are works using inactivation decoding, an efficient way of implementing Gaussian elimination, for this problem [2]. In this internship, the task of the student is to understand the advantages of polar codes under successive cancellation (SC) decoding [3] and investigate polar codes and their variants, e.g., Reed-Muller codes, under an inactivation decoder [4] to understand their performance compared to the existing works, e.g., [2].

[1] <https://arxiv.org/pdf/1512.02673.pdf>

[2] <https://arxiv.org/pdf/1712.08230.pdf>

[3] <https://arxiv.org/pdf/1901.06811.pdf>

[4] <https://arxiv.org/abs/2004.05969>

## Advisors

Mustafa Coskun