Associate Professorship of Coding and Cryptography
TUM Department of Electrical and Computer Engineering
Technical University of Munich

Seminar

Latency-Load Trade-off in Distributed Computing

The latency of a distributed computing algorithm mainly depends on the computation latency. However, the communication latency can also have a remarkable impact on the overall latency, e.g. when dealing with wireless links. By the application of coded computing schemes, the computation latency can be traded off against the communication latency, and vice-versa. This trade-off shall be analysed.

Literature:

- S. Li, M. A. Maddah-Ali, Q. Yu, and A. S. Avestimehr, “A fundamental tradeoff between computation and communication in distributed computing,” IEEE Trans. Inf. Theory, vol. 64, no. 1, pp. 109–128, Jan 2018.
- S. Li, M. A. Maddah-Ali, and A. S. Avestimehr, “A unified coding framework for distributed computing with straggling servers,” in IEEE Globecom Workshops (GC Workshop), Dec 2016, pp. 1–6.
- J. Zhang and O. Simeone, “Improved latency-communication trade-off for map-shuffle-reduce systems with stragglers,” arXiv preprint arXiv:1808.06583, 2018.

Prerequisites

- Basic knowledge about channel coding
- Basic knowledge about information theory
- Knowledge about coded computing is a plus

Advisors

Luis Maßny