

Federated Learning with Communication Constraints: Challenges in Compression Based Approaches

jeudi 9 mars 2023 12:10 (50 minutes)

In this presentation, I will present some results on optimization in the context of federated learning with compression. I will first summarise the main challenges and the type of results the community has obtained, and dive into some more recent results on tradeoffs between convergence and compression rates, and user-heterogeneity. In particular, I will describe two fundamental phenomenons (and related proof techniques): (1) how user-heterogeneity affects the convergence of federated optimization methods in the presence of communication constraints, and (2) the robustness of distributed stochastic algorithms to perturbation of the iterates, and the link with model compression. I will then introduce and discuss a new compression scheme based on random codebooks and unitary invariant distributions.

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