On structured linear measurements for tensor data recovery

Liza Rebrova
Princeton University, USA
elre@princeton.edu

Data-oblivious measurements present an important branch of low-rank data compression and recovery techniques, frequently used in streaming settings and within iterative algorithms. Typically, linear data-oblivious measurements involve some version of a random sketch that preserves the geometric properties of the data. When data is tensorial, a special challenge is to create a sketch with a structure that reflects tensor structure: this way, it can work similarly to a dense random sketch matrix but require much less memory to store and can be applied more efficiently. I will talk about our and others – including Tropp, Udell et al, De Lathauwer et al – recently proposed streaming sketch-based approaches for computing low-rank Tucker approximations of large tensors. I will discuss our new generalized theoretical guarantees for proving their accuracy on full-rank and noisy data with high probability from a wide range of measurements.