

Sketching Semidefinite Programs for Super-resolution Problems

jeudi 20 avril 2023 16:00 (30 minutes)

In this talk, we will consider the canonical example of a super-resolution problem: the recovery of a measure on $[0;1]$ from its first Fourier coefficients, assuming that the measure is the sum of a few spikes. Under weak assumptions, it is known that the measure to be recovered is the solution of a convex infinite-dimensional problem, which is in turn equivalent to a semidefinite program. This property yields a polynomial-time reconstruction algorithm with strong correctness guarantees.

Unfortunately, the size of the semidefinite program can be extremely large, even when the measure contains a very small number of spikes. I will present a sketching approach to reduce this size. Proving that this approach retains the correctness guarantees is still ongoing work. I will present a byproduct of our efforts to find proof, namely an algorithm to automatically find (simple) upper bounds on some integrals with parameters. This work is a collaboration with Augustin Cosse and Gabriel Peyré.

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