We present new heavy-hitters algorithms satisfying local-differential-privacy, with optimal or near-optimal worst-case error, running time, and memory. In our algorithms, the server running time is $\tilde{O}(n)$ and user running time is $\tilde{O}(1)$, hence improving on the prior state-of-the-art result of Bassily and Smith [STOC 2015] requiring $O(n^{5/2})$ server time and $O(n^{3/2})$ user time. With a typically large number of participants in local algorithms ($n$ in the millions), this reduction in time complexity is crucial for making locally-private heavy-hitters algorithms usable in practice.

Joint work with Raef Bassily, Kobbi Nissim, and Abhradeep Thakurta.