

Optimally building spanning graphs in the semi-random process

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The semi-random graph process is a randomised process that constructs a graph according to a mixture of random and strategic choices. In each round of the process, a vertex $v \in [n]$ is selected uniformly at random and offered to a Builder, who chooses another vertex $w \in [n]$ and adds the edge vw to the graph. There has been recent interest in how the addition of strategic agency affects the evolution of this process and, in particular, how it can accelerate the time at which certain substructures appear. We show that for any n -vertex graph H with maximum degree Δ , Builder can (with high probability) construct a copy of H in asymptotically optimal time (i.e., in time $(1 + o_\Delta(1))\Delta n/2$, where $o_\Delta(1)$ denotes a function of Δ tending to zero as Δ tends to infinity). Joint work with Michael Anastos, Joshua Erde, Mihyun Kang, Dominik Schmid, and Gregory Sorkin.

In Special Session 52 on Extremal and Probabilistic Combinatorics at the Mathematical Congress of the Americas 2025.