Conditional determinantal processes are determinantal

Abstract:

A determinantal point process governed by a locally trace class Hermitian contraction kernel on a measure space $\mathcal{E}$ remains determinantal when conditioned on its configuration on an arbitrary measurable subset $B \subseteq \mathcal{E}$. Moreover, the conditional kernel can be chosen canonically in a way that is "local" in a non-commutative sense, i.e. invariant under "restriction" to closed subspaces $L^2(B) \subseteq P \subseteq L^2(\mathcal{E})$.

Using the properties of the canonical conditional kernel we establish a conjecture of Lyons and Peres: if $K$ is a projection then almost surely all functions in its image can be recovered by sampling at the points of the process.