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Optimal stationary markings

Joint with Bartek Błaszczyszyn

How to describe hard-core thinnings of stationary particle processes, which maximize the volume fraction? How to choose the transmission powers in a network of base stations so as to maximize the global throughput? What is the optimal placement of content in a network of spatially distributed caches? All of these questions can be cast into the framework of optimal stationary markings of point processes.

We offer intensity-optimal and locally optimal markings as two possible formalizations of this concept. We discuss the question of existence and under which conditions the two notions coincide. By forming connections to stabilization techniques from stochastic geometry, many of the core ideas from the special setting of maximal hard-core thinnings [1] can be extended to optimal markings. Moreover, the more general setting also gives rise to novel examples of uniqueness and non-uniqueness.

References

[1] C. Hirsch and G. Last (2018) On maximal hard-core thinnings of stationary particle processes. *J. Stat. Phys.* **170** (3), 554–583.