Spectrum of Achievable Performances

What (request type) distribution features drive algorithmic performance?

To answer this question, we focus on the multi-secretary problem

A decision maker must dynamically and irrevocable accept/reject T secretaries with i.i.d rewards drawn from a known distribution F as to maximize the sum of top B chosen secretaries





Dynamic Resource Allocation: Algorithmic **Design Principles and** Spectrum of Achievable Performances arxiv.org/abs/2205.09078



Akshit Kumar Yash Kanoria

We analyze a very practical simulationbased algorithm

our work

All types are present logarithmic regret our work multi-secretary polynomial regret β – clustered distributions

Algorithmic Design Principles

What algorithmic principle(s) achieve near-optimal regret scaling?



Is there a unifying optimal algorithm agnostic to distribution details?

Repeatedly Act using Multiple Simulations (RAMS)

simulate multiple demand scenarios at each decision epoch and choose the action which maximizes reward over the multiple simulated scenarios



Operationalizes the CwG principle

Recovers most known gurantees

Strong numerical 5 5.5 performance