

Stable Secretaries

[Abstract]

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We define and study a new variant of the secretary problem. Whereas in the classic setting multiple secretaries compete for a single position, we study the case where the secretaries arrive one at a time and are assigned, in an on-line fashion, to one of *multiple* positions. Secretaries are ranked according to talent, as in the original formulation, and in addition positions are ranked according to attractiveness. To evaluate an online matching mechanism, we use the notion of *blocking pairs* from stable matching theory: our goal is to maximize the number of positions (or secretaries) that do not take part in a blocking pair. This is compared with a *stable matching* in which no blocking pair exists. We consider the case where secretaries arrive randomly, as well as that of an adversarial arrival order, and provide corresponding upper and lower bounds.

CCS Concepts: •**Theory of computation** → **Online algorithms**; *Algorithmic game theory*; **Algorithmic game theory and mechanism design**;

Additional Key Words and Phrases: Secretary Problem; stable matching; blocking pair

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