

BI-CO MATHEMATICS COLLOQUIUM

Lili Dworkin '11
University of Pennsylvania

"Multi-Armed Bandits: How to Win in Vegas"

Monday, February 2, 2015

Talk at 4:00 – H109

Tea at 3:30 – KINSC Math Lounge, H208

Abstract:

In the classic multi-armed bandit problem, a gambler faces a row of slot machines (nicknamed “one-armed bandits”) and must choose which one to play. The machines look identical, but some are luckier than others. In particular, each machine is associated with a different probability distribution, and yields a random reward drawn from that distribution when played. Suppose the gambler picks a machine and wins some money. Now the question arises: when he returns to the casino tomorrow, should he play the same machine again, or try a different one? Although this scenario is admittedly whimsical, the general version of the problem has applications in many domains, including clinical trials, network routing, and advertising. In this talk, I will discuss algorithms that the gambler can use to maximize his winnings. I will then describe ongoing research in the area, specifically on variants of the problem in which the winnings depend not only on the machine chosen, but on side information (such as the time of day) as well.

HAVERFORD COLLEGE