

Adding police to a mathematical model of burglary

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Abstract

We present a mathematical model of burglary in an urban environment. This work builds on the previous work of Short et al. We consider a uniform lattice with one house located at each lattice site. The model is derived from discrete difference equations that govern the attractiveness of individual houses to burglars and the movement of burglars on the lattice. We see that the continuum approximation to these difference equations gives rise to pattern formation. We also add a third equation to the system that governs the deterrence caused by visible police presence, and we discuss the corresponding optimal control problem.