AGENT-BASED MODELING FOR DECISION ANALYTICS IN POLICE PATROL OPERATIONS

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ABSTRACT

Police patrolling plays a vital role in ensuring the safety and sustainable development of communities. The complex nature of the policing system often makes it very challenging to manage and control. The dynamic and stochastic criminal behavior, compounded with limited policing resources, are rendered current police operations inefficient. An agent-based policing framework is developed to conquer these weaknesses by addressing the dynamically changing complexities and uncertainties in police operations and adaptively optimizing operational performance based on the state of the policing system. A real-world case study is conducted to illustrate how this framework is used in dynamic patrol deployment planning.

Keywords: Agent-based modeling, Complex Systems Modeling, Police Patrol Operation, Hot Spots Policing, Dynamic Policing.