Optimal Epidemic Information Dissemination in Uncertain Dynamic Environment

ABSTRACT

Optimization of stochastic epidemic information dissemination plays a significant role in enhancing the reliability of epidemic networks. This letter proposes a multi-stage decisionmaking optimization model for stochastic epidemic information dissemination based on dynamic programming, in which uncertainties in a dynamic environment are taken into account. We model the inherent bimodal dynamics of general epidemic mechanisms as a Markov chain, and a state transition equation is proposed based on this Markov chain. We further derive optimal policies and a theoretical closed-form expression for the maximal expected number of successfully delivered messages. The properties of the derived model are theoretically analyzed. Simulation results show an improvement in reliability, in terms of accumulative number of successfully delivered messages, of epidemic information dissemination in stochastic situations.

EXISTING SYSTEM

- In existing system, the sociality-aided adaptive recovery epidemic routing was proposed.
- At this point, a stochastic modeling can be more appealing to deal with a decision-making problem in dynamic environments.
- Thereby falling within the deterministic modeling paradigms in which modeling-related parameters are usually determined without consideration of uncertainties inherent in a targeted system, whereas in real scenarios of mobile communications.

PROPOSED SYSTEM

- Our proposed multi-stage dynamic programming model in an uncertain dynamic environment is adopted.
- We focus on modeling the optimal control of the fan-out of epidemic information dissemination in one node as a sequential multi-stage decision-making process.
- With the Markov chain, we use the dynamic programming technique to develop the optimization model for stochastic epidemic information dissemination.

SYSTEM REQUIREMENTS

HARDWARE REQUIREMENTS

- •Processor Intel core i3
- •RAM 2B
- •Hard Disk 20 GB

SOFTWARE REQUIREMENTS

- •Operating System : LINUX
- •Tool : Network Simulator-2
- •Front End : OTCL (Object Oriented Tool Command Language)

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