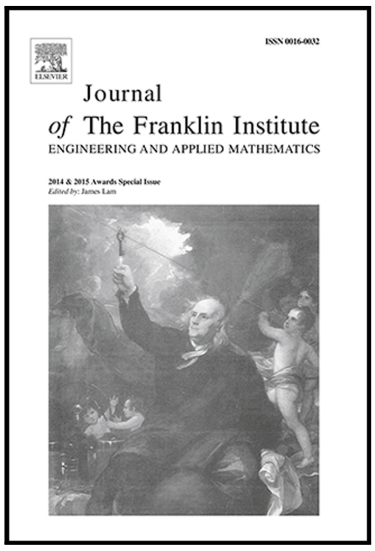

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Optimal Jamming Attack Schedule for Remote State Estimation with Two Sensors

Lianghong Peng[a,b], Xianghui Cao[a,b], Hongbao Shi[a,b], Changyin Sun[a,b,*]

[a] *School of Automation, Southeast University, Nanjing, Jiangsu, 210096, China*
[b] *Key Lab of Measurement and Control of Complex Systems of Engineering, Ministry of Education, Southeast University, Nanjing, Jiangsu, 210096, China*

Abstract

In cyber-physical systems (CPS), cyber threats emerge in many ways which can cause significant destruction to the system operation. In wireless CPS, adversaries can block the communications of useful information by channel jamming, incurring the so-called denial of service (DoS) attacks. In this paper, we investigate the problem of optimal jamming attack scheduling against remote state estimation wireless network. Specifically, we consider that two wireless sensors report data to a remote estimator through two wireless communication channels lying in two unoverlapping frequency bands, respectively. Meanwhile, an adversary can select one and only one channel at a time to execute jamming attack. We prove that the optimal attack schedule is continuously launching attack on one channel determined based on the system dynamics matrix. The theoretical results are validated by numerical simulations.

Keywords: Cyber-physical systems, optimal attack schedule, jamming attack, remote state estimation.

1. Introduction

Known as an integrations of computation, networking, and physical processes, Cyber-Physical Systems (CPS) have received significant attention in

*Corresponding author
Email address: cysun@seu.edu.cn (Changyin Sun)