

NORTHWESTERN INSTITUTE ON COMPLEX SYSTEMS PRESENTS

Wednesdays

@NICO



From Human Behavior to the Spread of Mobile Viruses

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12:00 - 1:00 PM

(Refreshments served at 11:45)

Chambers Hall, 600 Foster Street

Lower Level Classroom

Lacking a standardized operating system, traditional cellphones have been relatively immune to viruses. Smartphones, however, can share programs and data with each other, representing a fertile ground for virus writers. Indeed, since 2004 more than 420 smartphone viruses have been identified. Given smartphones' high annual growth rate, they are poised to become the dominant communication device in the near future, raising the possibility of virus breakouts that could overshadow the disruption caused by traditional computer viruses. To understand the spreading patterns of mobile phone viruses, we must know human's collective and individual behaviors, such as human's communication pattern and mobility pattern, which provide the spreading channels for the MMS and Bluetooth viruses. Based on the statistical analysis of human behaviors, we model the mobility of mobile phone users to study the fundamental spreading patterns characterizing a mobile virus outbreak. We find that while Bluetooth viruses can reach all susceptible handsets with time, they spread slowly due to human mobility, offering ample opportunities to deploy antiviral software. In contrast, viruses utilizing multimedia messaging services could infect all users in hours, but currently a phase transition on the underlying call graph limits them to only a small fraction of the susceptible users. These results explain the lack of a major mobile virus breakout so far and predict that once a mobile operating system's market share reaches the phase transition point, viruses will pose a serious threat to mobile communications.

NICO Coffee Hour will follow for questions, networking, and collaboration.

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