

New statistical model examines massive amounts of data to automatically spot anomalies

July 31 2017

With the number of security breaches and cyber-attacks on the rise and reports of the financial burden of these varying from \$400 billion a year to \$2.1 trillion by 2019, cyber-security experts may soon have a new tool in the fight against online threats. Patrick Rubin-Delanchy, Heilbronn Research Fellow in Statistics at the University of Oxford, will present a new statistical method for monitoring networks to automatically detect "strange behavior" and ultimately prevent intrusion on Monday, July 31, at the 2017 Joint Statistical Meetings (JSM).

Data arising in cyber-security applications often have a <u>network</u> structure. A tool that monitors networks has access to massive amounts of data of which "normal" behavior can be observed. "Since data on intrusions is lacking," notes Rubin-Delanchy "accurate statistical modeling of connectivity behavior has important implications, particularly for network intrusion detection."

Rubin-Delanchy—in collaboration with Nick Heard, reader in statistics at Imperial College London, and Carey Priebe, professor of statistics at The Johns Hopkins University—has developed a "linear algebraic" approach to network anomaly detection, in which nodes are embedded in a finite dimensional latent space, where common statistical, signalprocessing and machine-learning methodologies are then available. They illustrate results from their methodology on network flow data collected at Los Alamos National Laboratory.



In contrast with traditional cyber-security approaches like anti-virus software, the new methodology is not based on hand-engineered signatures, but rather machine learning in which programs can access and use the data and learn for themselves. "Our anticipation is that this model will provide a more robust approach to cyber-security in the future."

Additional presentations about cybersecurity at JSM will be led by other renowned experts, including the following:

- Mark Briers, Alan Turing Institute
- Marina Evangelou, Imperial College London
- John Abowd, U.S. Census Bureau
- Melissa Turcotte, Los Alamos National Laboratory
- Christopher White, Microsoft

Provided by American Statistical Association

Citation: New statistical model examines massive amounts of data to automatically spot anomalies (2017, July 31) retrieved 26 April 2024 from <u>https://phys.org/news/2017-07-statistical-</u> <u>massive-amounts-automatically-anomalies.html</u>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.