

Detecting the Online Enemy, New Statistical Model Examines Massive Amounts of Data to Automatically Spot Anomalies

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BALTIMORE, Md. (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 network 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, signal-processing 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

Media can attend JSM for FREE, but must pre-register by emailing Jill Talley, ASA public relations manager, at jill@amstat.org.

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About JSM 2017

JSM 2017 is the largest gathering of statisticians and data scientists in the world, taking place July 29–August 3, 2017, in Baltimore. Occurring annually since 1974, JSM is a joint effort of the American Statistical Association, International Biometric Society (ENAR and WNAR), Institute of Mathematical Statistics, Statistical Society of Canada, International Chinese Statistical Association, International Indian Statistical Association, Korean International Statistical Society, International Society for Bayesian Analysis, Royal Statistical Society and International Statistical Institute. JSM activities include oral presentations, panel sessions, poster presentations, professional development courses, an exhibit hall, a career service, society and section business meetings, committee meetings, social activities and networking opportunities.

About the American Statistical Association

The ASA is the world's largest community of statisticians and the oldest continuously operating professional science society in the United States. Its members serve in industry, government and academia in more than 90 countries, advancing research and promoting sound statistical practice to inform public policy and improve human welfare. For additional information, please visit the ASA website at www.amstat.org.

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