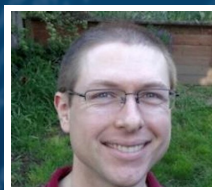# Machine Learning Defends Internet Security

Daniel Lowd
Assistant Professor, Computer and Information Science

CURRENT RESEARCH

Algorithms that are learning to protect consumers

Machine learning has been used to detect a lot of malicious behavior, such as online auction fraud, fake reviews, spam, credit card fraud, and more. Therefore, researchers are trying to find solutions for making machine learning work when people are actively working to defeat it. Dr. Daniel Lowd, of the University of Oregon, uses game theory and machine learning to develop new algorithms that learn more robust classification models. By modeling the problem as a game between the machine learning system and the adversaries working to defeat it, Dr. Lowd and his team can use game theory to find an optimal strategy for each player, giving them an optimally robust classifier. With the help of game theory, Dr. Lowd hopes to make machine learning robust enough to apply to adversarial domains thereby making the Internet safer.

Dr. Lowd is particularly interested in learning robust classifiers for complex problems with many related predictions, such as labeling spammers in a social network or fake reviews in a network of user and product reviews. He hopes to develop a better understanding of the vulnerabilities of our current models, the weaknesses that attackers can exploit, and how to fix them. Dr. Lowd is collaborating with industry to apply and evaluate his methods in real-world settings. Finally, Dr. Lowd hopes to learn about the adversaries affecting computer learning as well as by seeing how spammers change their emails over time, researchers may be able to learn what spammers' weaknesses are and build models that exploit those as well. Machine learning has already had a huge impact and it has tremendous promise for the future. But in order to be effective, machine learning must be more robust; Dr. Lowd is...

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AFFILIATION

University of Oregon

EDUCATION

- Ph.D. in Computer Science and Engineering, 2010
University of Washington

AWARDS

- Google Faculty Research Award, 2013
- Microsoft Research Fellow, 2007-2008
- Graduate Research Fellowship, 2003-2006

RESEARCH AREAS

Technology, Computational Sciences / Mathematics, IOT, Devices, Data

FUNDING REQUEST

Your contributions will support the continued research of Dr. Daniel Lowd, of the University of Oregon, as he makes machine learning work even as people actively try to defeat it. Your donations will support the $60K per year required to support graduate research assistants and the additional costs of travel and computer hardware. In choosing to support his research, you will be supporting the tremendous promise machine learning has for our future.