Alesia Chernikova

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Summary

Innovative PhD candidate with 7+ years of research experience in academic and industry settings. Knowledgeable and passionate about solving research problems at the intersection of security, network science, and deep learning. Experienced in collaborating in extensive research studies involving real-world data and research problems in cybersecurity, autonomous vehicles, and financial domains, which led to 5+ publications and the development of tools to automate the results.

Experience

Graduate Research Assistant
Northeastern University
Sep 2017 - Present (6 years 1 month)

• Proposed a new compartmental model to represent the behavior of self-propagating malware (SPM) in the networks using real-world WannaCry traces and rigorously studied the characteristics of the SPM propagation process under homogeneous mixing assumption and on arbitrary networks.
• Proposed new defense algorithms and extensively tested its behavior along with existing techniques to improve network robustness of the large enterprise network in the face of SPM by leveraging spectral graph theory.
• Proposed and implemented a new framework for evasion attack algorithms that preserve possible feature dependencies to evaluate the robustness of deep learning models in constrained environments such as cybersecurity or healthcare. Evaluated the success of existing defense algorithms against proposed algorithms.
• Designed and implemented evasion attacks against classification and regression models used in the self-driving car domain for the first time.

Teaching Assistant (CS4100: AI)
Northeastern University
Sep 2023 - Present (1 month)

Teaching Assistant (CS4100: AI)
Northeastern University
Sep 2022 - Dec 2022 (4 months)

• Graded exams and homework for a class of 90+ students.
• Managed weekly office hours.
• Assisted professor in homework and exam preparation.
• Advised students regarding final projects.

Applied Scientist Intern
Amazon Web Services (AWS)

May 2021 - Sep 2021 (5 months)
• Collaborated with the project manager and senior research scientists to identify customer needs, proposed directions of possible research questions to address them, and described the methodologies to solve them.
• Created a scalable algorithm for tracing the activity in the AWS cloud represented as a heterogeneous graph to allow further research based on AWS cloud activity data.

Applied Scientist Intern
Amazon Web Services (AWS)
May 2020 - Aug 2020 (4 months)
• Proposed and implemented the methodology for lateral movement detection in the AWS cloud environment using Bayesian statistics and network science perspectives.
• Participated in the AWS internal conference and presented the results for AWS Security teams.

Senior Software Engineer
IBA Group
Nov 2013 - Jul 2017 (3 years 9 months)
• Participated in designing and developing all aspects of the multi-page IBM GSAR web portal.
• Tested software for bugs, fixing them and maintaining the portal's performance.
• Assisted the software architect with the efficiency and usability improvement of the portal.

Undergraduate Research Assistant
Belarusian State University
Jan 2012 - Dec 2013 (2 years)
• Collaborated with a team of 9 people, including professors, post-doctoral, graduate, and undergraduate students, and a scientist from the National Bank of the Republic of Belarus in the research project for the estimation and evaluation of credit rankings of national enterprises using real-world financial data from the monitoring system.
• Participated in creating the methodology for credit rankings estimation using mathematical, statistical, and econometric methods and models.
• Independently achieved and managed the results for the building enterprise section.
• Collaborated in developing the package for automated calculation of credit scores based on the proposed credit rankings evaluation methodology.

Education

Northeastern University
Doctor of Philosophy, Computer Science
2017 - 2023
GPA: 3.9, Advisor: Dr. Alina Oprea
Relevant Coursework: Advanced Machine Learning (Bayesian methods for probabilistic modeling and inference), Data Visualization, Machine Learning, Advanced Algorithms, Data Mining (Unsupervised Learning), Distributed Systems.

Belarusian State University
Bachelor of Science, Applied Mathematics and Computer Science

2009 - 2014
GPA: 3.8, Advisor: Dr. Vladimir Malugin
Thesis: “Development of risk management algorithms based on derivatives contracts."
Relevant Coursework: Theory of Probabilities and Mathematical Statistics, Methods of Optimization, Multivariate Statistical Analysis, Mathematical Theory of Forecasting, Discrete Mathematics and Graph Theory, Differential Equations, Matrix Analysis, Real and Complex Analysis, Algorithms and Data Structures, Operating Systems, Networks, C/C++ programming, Java programming.

Skills

Artificial Intelligence (AI) • Cyber Threat Intelligence (CTI) • Data Science • Network Science • Deep Learning • Cloud Security • AI Security • Python (Programming Language) • TensorFlow • PyTorch

Honors & Awards

Khoury College of Computer Science Fellowship - Northeastern University
Sep 2017

National Bank of the Republic of Belarus Merit Scholarship - National Bank of the Republic of Belarus
Sep 2013

BSU Excellence Merit Scholarship - Belarusian State University
Sep 2009