# Matthew Landen
PhD Student

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## Summary

Aiming to create intrusion detection methods that are successful in detecting sophisticated, targeted cyber-attacks before they cause serious damages to the critical resources of enterprise companies. My next employment availability is for internships in the summer of 2021.

## Research Interests

Attack detection, systems and network security

## Education

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|---|---|---|---|
| Ph.D. | Georgia Institute of Technology | | Atlanta, Georgia |
| | Computer Science | | Expected May 2023 |
| | *Specialization:* Information security | | |
| | Minor: Security and privacy policy | | |
| | Advisor: Dr. Wenke Lee | | |
| | NSF Graduate Research Fellow | | $34,000 / year, 3 years |
| | Georgia Tech Presidential Fellowship | | $5,500 / year, 4 years |
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| B.S. | University of Maryland, Baltimore County (UMBC) | | Baltimore, Maryland |
| | Computer Science and Mathematics, Summa Cum Laude | | May 2017 |
| | Meyerhoff Scholar | | $15,000 / year, 4 years |
| | Phi Kappa Phi Honors Society Member | | April 2017 – Present |
| | GPA: 4.0 / 4.0 | | |

## Research Experiences

Georgia Tech, Institute for Information Security & Privacy (IISP)                 Atlanta, GA
Advisor: Dr. Wenke Lee                                                  August 2017 – Present

Leveraging provenance audit for intrusion detection
- Extract representations of attack tools to later enhance intrusion detection systems by flagging attack tool reuse

Android malware classification using machine learning
- Features capture the frequency that a sensitive API call is invoked by an android framework entrypoint
- Outcomes
  - (Allen, 2018): Improving Accuracy of Android Malware Detection with Lightweight Contextual Awareness

UMBC MAPLE Lab                                                          Baltimore, MD
Advisor: Dr. Marie desJardins                               November 2016 – August 2017

Planning with learned subtask hierarchies in reinforcement learning domains
- Designed and implemented a hierarchical reinforcement learning algorithm using BURLAP java library
- Implanted R-MAXQ as a baseline to our approach
- Outcomes
  - (Squire, 2017): R-AMDP: Model-Based Learning for Abstract Markov Decision Process Hierarchies

- o (Winder, 2017): Towards Planning With Hierarchies of Learned Markov Decision Processes

National Institute of Standards and Technology                                    Gaithersburg, MD
Advisors: Michaela Iorga, Ph.D. and Dmitry Cousin                              May 2015 – May 2017
   Hash chaining for secure and privacy-preserving digital forensics in the cloud
   - Implemented a hash chain logging approach in a research cloud environment using java which has applications in information security and privacy-preserving digital forensics
   NIST cloud security framework analyzer and visualizer
   - Developed a tool in C# that allows agencies to analyze the NIST cloud computing security architecture and see pertinent information in a variety of situations as well as visual trends

## Publications

Winder, J., Milani, S., **Landen, M**., Oh, E., Parr, S., Squire, S., ... & Matuszek, C. (2019). Planning with Abstract Learned Models While Learning Transferable Subtasks. arXiv preprint arXiv:1912.07544.

Joey Allen, **Matthew Landen**, Sanya Chaba, Yang Ji, Simon Chung, Wenke Lee "Improving Accuracy of Android Malware Detection with Lightweight Contextual Awareness" In Annual Computer Security Applications Conference, 2018

Shawn Squire, John Winder, **Matthew Landen**, Stephanie Milani, Marie desJardins "R-AMDP: Model-Based Learning for Abstract Markov Decision Process Hierarchies" In The Multi-disciplinary Conference on Reinforcement Learning and Decision Making 2017, 2017

John Winder, Shawn Squire, **Matthew Landen**, Stephanie Milani and Marie desJardins "Towards Planning With Hierarchies of Learned Markov Decision Processes" In ICAPS-2017 Integrated Execution of Planning and Acting Workshop, pg 50-53, 2017

## Technological Skills

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|---|---|
| **Programming Languages:** | Java, Python, C, C++, C#, Visual Basic, intel assembly, HTML, CSS, JavaScript, PHP, SQL, Latex |
| **Frameworks / Libraries:** | Python – Keras, Sklearn, NumPy, Pwntools;<br>Web – Jquery, AngularJS |
| **Tools:** | Git, IDA Disassembler |

## Teaching Experience

Georgia Institute of Technology
    Fall 2018    CS 6262 – Network Security    Teaching Assistant
University of Maryland, Baltimore County
    Fall 2016    COMP 101 – Computational Thinking and Design    Head Teaching Fellow
    Fall 2015    COMP 101 – Computational Thinking and Design    Teaching Fellow

## Honors

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|---|---|
| NSF Graduate Research Follow ($34,000 / year, 3 years) | August 2017 - Present |
| Georgia Tech Presidential Fellowship ($5,500 / year, 4 years) | August 2017 - Present |
| Phi Kappa Phi Honors Society Member | April 2017 - Present |
| 2nd place team in Georgia Tech's Capture the Flag Competition | November 2018 |
| Meyerhoff Scholar ($15,000 / year, 4 years) | August 2013 - May 2017 |
| President's List | August 2013 - May 2017 |

National Honor Society                                          August 2011- May 2013

## Conferences & Workshops Attended

AAAI Conference on Artificial Intelligence                                          February 2020
Annual Computer Security Applications Conference                                   December 2018
USENIX Security and Artificial intelligence Networking Workshop                          May 2018
CRA Grad Cohort Workshop for Underrepresented Minorities + Persons with Disabilities   March 2018, 2020
ACM Richard Tapia Celebration of Diversity in Computing                          September 2017
The Multi-disciplinary Conference on Reinforcement Learning and Decision Making          June 2017

## Relevant Employment

United States Defense Intelligence Agency                                          College Park, MD
Student Intern                                                               June 2014 – August 2017
   Software engineering projects
   - Developed a tool to update a mailing list for updates specific to a piece of software automatically
   - Engineered software to get digital certificate information from users on a website

## Personal Interests

Performing in theatre productions                                          September 2010 – May 2017