

Miel Verkerken

PHD RESEARCHER · TEACHING ASSISTANT

Ghent University - IDLAB in collaboration with IMEC, Department of Information Technology

✉ mielverkerken@hotmail.com | 📧 mielverkerken | 🎓 Miel Verkerken

Summary

I am PhD Researcher and Teaching Assistant at the Department of Information Technology (IDLab) of Ghent University in collaboration with imec. In my research I apply AI to cybersecurity for a safer society. Currently, I am mainly focusing on the challenges associated with next-generation intrusion detection systems that rely on machine learning techniques.

Before starting my doctoral studies, I gained international experience within the broad IT landscape through both studies and work, resulting in my strong technical background. I describe myself as a positive and motivated team player, who is not afraid of getting out of his comfort zone and eager to learn. I am looking forward to help creating a better world through innovative technology.

Education

DEGREES

Ph.D. Information Engineering Technology

Ghent, Belgium

GHENT UNIVERSITY, IDLAB - IMEC

Sep. 2019 - PRESENT

- PhD topic on "Adaptive Data Processing for Cybersecurity Applications", focusing on applying AI to intrusion detection
- (Co-)Authored published peer-reviewed publications in international journals and conferences:
 - 2023 **A Novel Multi-Stage Approach for Hierarchical Intrusion Detection**
IEEE Transactions on Network and Service Management, *IEEE*
 - 2023 **Characterizing the Impact of Data-Damaged Models on Generalization Strength in Intrusion Detection**
Journal of Cybersecurity and Privacy, *MDPI*
 - 2023 **Investigating Generalized Performance of Data-Constrained Supervised Machine Learning Models on Novel, Related Samples in Intrusion Detection**
Sensors, *MDPI*
 - 2022 **Task Assignment and Capacity Allocation for ML-based Intrusion Detection as a Service in a Multi-tier Architecture**
IEEE Transactions on Network and Service Management, *IEEE*
 - 2022 **Discovering Non-Metadata Contaminant Features in Intrusion Detection Datasets**
International Conference on Privacy, Security & Trust (PST), *IEEE*
 - 2022 **Establishing the Contaminating Effect of Metadata Feature Inclusion in Machine-Learned Network Intrusion Detection Models**
International Conference on Detection of Intrusions and Malware, and Vulnerability Assessment, *Springer*
 - 2022 **Towards Model Generalization for Intrusion Detection: Unsupervised Machine Learning Techniques**
Journal of Network and Systems Management, *Springer Science*
 - 2021 **Hierarchical feature block ranking for data-efficient intrusion detection modeling**
Computer Networks, *Elsevier*
 - 2021 **Machine learning based intrusion detection as a service: task assignment and capacity allocation in a multi-tier architecture**
14th International Conference on Utility and Cloud Computing Companion, *IEEE/ACM*
 - 2020 **Unsupervised Machine Learning Techniques for Network Intrusion Detection on Modern Data**
Cyber Security in Networking Conference (CSNet), *IEEE*
- Presented poster "Fixing the Foundations: Towards Generalization for Machine Learning Intrusion Detection Systems" at Network and Distributed System Security 2023 (NDSS)
- Reviewer at Journal of Big Data, Scientific Reports Nature, Peer-to-Peer Networking and Applications, Jordanian Journal of Computers and Information Technology
- Guiding and supporting Master students as supervisor with their Master's thesis
- Established new international collaboration between two academic research departments

Erasmus+ Exchange - M.Sc. Computer Science

Uppsala, Sweden

UPPSALA UNIVERSITY

Jan. 2018 - Jun. 2018

- Master Thesis: *Monitoring Financial Transactions: Efficient Algorithms for Streaming Data*
- Evaluated a case study of FADO, a provably efficient algorithm yet computational feather-light and intuitive, on Anti-Money Laundering.
- Accomplished Global Software Product Development, a collaboration between three universities in Sweden, Finland and Vietnam

B.Sc. & M.Sc. Information Engineering Technology (Cum Laude, Cum Laude)

Ghent, Belgium

GHENT UNIVERSITY

Sep. 2014 - Jun. 2018

EXTRA-CURRICULAR COURSES

2022	Winter School Cyberwal in Galaxia Program , UCLouvain	<i>Transinne, Belgium</i>
2022	Ethical Hacking I & II , KTH Royal Institute of Technology	<i>Stockholm, Sweden</i>
2022	Summer School on Security and Privacy in the (golden) Age of AI , KU Leuven	<i>Leuven, Belgium</i>
2020	Big Data Science , Ghent University	<i>Ghent, Belgium</i>
2019	Machine Learning , Ghent University	<i>Ghent, Belgium</i>
2019	Software Protection and Hacking , Ghent University	<i>Ghent, Belgium</i>

LICENSES & CERTIFICATIONS

2020	Cybersecurity: an academic perspective into recent application domains , Uppsala University
2019	Spring Professional , Pivotal Software, Inc.
2019	eLearnSecurity Junior Penetration Tester (eJPT) , eLearnSecurity

Work Experience

Ghent University

Ghent, Belgium

TEACHING ASSISTANT

Sep. 2019 - PRESENT

- Member of Education Committee Information Engineering Technology
- Responsible for preparing, teaching and examination of computer labs for the following courses:
 - Object Oriented Programming (OOP)
 - Software Engineering
 - Server-side application frameworks
 - Web Technologies

ING Bank

Amsterdam, The Netherlands

IT CLASS TRAINEE

Sep. 2018 - Aug. 2019

- The IT Class program gives talented IT graduates the necessary grounding to become top IT specialists.
- Youngest trainee selected from few thousands of applicants to the class together with 20 ambitious recent graduates from all over the world.
- The one-year traineeship consists of 4 unique rotations in different business units of ING.
 1. **DevOps Engineer at Bank Mendesgans**
Member of an agile squad working on tasks from the backlog
Java Development (Spring), CI/CD, Software Testing (Unit, Integration, Acceptance), Internal Release Presentation
 2. **Data Scientist at Finance Advanced Analytics**
Development of open-source hierarchical time-series forecasting package: Blog, GitHub
Implementation forecasting and anomaly detection algorithms in R, Deployment internal Shiny dashboard (OpenShift, Docker, LDAP, GitLab CI/CD)
 3. **Site Reliability Engineer at Real-Time Payment Engine**
Responsible for implementation and deployment monitoring solution using Prometheus and Grafana.
Organization of internal knowledge sharing workshop for other squads.
 4. **Data Engineer at Yolt**
Migration of rule-based to machine-learning engine to detect subscriptions in transaction enrichment pipeline.
Development of a new microservice from scratch and training of models using Scala, Python, Cassandra, gRPC, Airflow and Kafka.

Showpad

Ghent, Belgium

SOFTWARE ENGINEER INTERN

Jul. 2017 - Sep. 2017

- Developed an (internal) tool that automates manual actions of the Customer Success Team.
- Responsible for the full-stack development of a single micro-service and communication with other internal services and teams.
- Internship extended with student job.
- Technologies: PHP, Angular, NodeJS, micro-service architecture

Honors & Awards

COMPETITIONS

2023	Best Paper Award Winner - "Castles Built on Sand: Observations from Classifying Academic Cybersecurity Datasets with Minimalist Methods" , IoTBDS 2023	<i>Prague, Czech Republic</i>
2020	Track Winner - Make Conversational AI Work , Junction Hackathon	<i>Remote, Europe</i>
2020	Track Runner-Up - Utility Shopping Redisgned , Junction Hackathon	<i>Remote, Europe</i>
2020	Winner , BlueCherry Hackathon	<i>Knokke, Belgium</i>
2016	Winner Preliminary and Local Round , European BEST Engineering Competition (EBEC)	<i>Ghent, Belgium</i>
2015	Winner Preliminary Round , European BEST Engineering Competition (EBEC)	<i>Ghent, Belgium</i>