

Curriculum Vitae

Name **Dr. Igor Khokhlov**

Assistant Professor of Cybersecurity at the School of Computer Science and Engineering at Sacred Heart University, Connecticut, USA

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Contact Information

Web-site: <https://sites.google.com/view/igor-khokhlov>

Google Scholar profile:

<https://scholar.google.com/citations?user=NrrJOskAAAAJ&hl=en>

Summary

PhD in Computing and Information Sciences (2016-2020)

MS (2006-08) and **BS** (2001-2006) in Electronics

Research products

- 30 publications (2017-2023) including 25 as the first author in IEEE journals and conferences, ELSEVIER applied soft computing journal;
- 293 citations (2017 - 2023), H-index of 8;
- Outstanding Student Paper award;
- 5 apps on Google Play with 655 downloads;
- Postdoc (2020) on DHS funded project;
- RA (2016-20) on NSF funded projects.

Research expertise in

Computer Security, Data and Information Management, Artificial Intelligence and Machine Learning

Industrial experience:

Software Developer (2008-2015), Team Leader (2014-2015)
6 presentations to professional conferences (2018-19)

Education

Aug. 2016 - Aug. 2020
Ph.D. in Computing and
Information Sciences

Thesis: “Integrated Framework for Data Quality and Security
Evaluation on Mobile Devices”

Advisor: Dr. Leon Reznik
Department of Computer Science,
B. Thomas Golisano College of Computing and Information Sciences,
Rochester Institute of Technology

Relevant Course-Work:

GPA 3.85

*Foundations of Intelligent Systems, Foundations of Intelligent
Security Systems, Quantitative Foundations, Cyberinfrastructure
Foundations, Sensor and SCADA Security, Foundations of
Human-Computer Interaction, Current Topics in Human-Computer
Interaction, Research Foundations, Teaching Skills.*

Sep. 2005-June 2007
Master’s Degree with Honors in
Electronics

National Technical University of Ukraine "KPI"
Thesis title: Methods of a microsatellite space orientation
Advisor: Prof. Tatiana Tereshchenko

Sep. 2001 -July 2005
Bachelor's Degree with Honors
in Electronics

National Technical University of Ukraine "KPI"
Thesis title: Data processing subsystem of a microsatellite
Advisor: Prof. Valerii Zhuikov

Grants:

- Kaya, T. (Principal), Bowlyn, K. (Co-Principal), Khokhlov, I. (Co-Principal), Senbel, S. (Co-Principal), Shaenfield, D. (Co-Principal), "Increasing Perseverance and Retention of Computing and Engineering Students Through Service," Sponsored by National Science Foundation. (October 1, 2022 - September 30, 2027).
- Khokhlov, I. (Co-Principal), "Security Evaluation and Improvement of the Personal Cyberinfrastructure with New Tools and Education Development," Sponsored by CRDF Global. (August 31, 2021 - August 31, 2022).
- Reznik R. (Principal), Igor Khokhlov (Co-Principal), “Self-learning capabilities for a mission-oriented data quality and security assurance in military IoT systems,” Sponsored by US Military Academy/DoD, (September 30, 2020 - September 29, 2021).

Products

Publications (293 citations, H-index is 8)

1. Okutan, Ahmet, Peter Mell, Mehdi Mirakhorli, Igor Khokhlov, Joanna CS Santos, Danielle Gonzalez, and Steven Simmons. "Empirical validation of automated vulnerability curation and characterization." *IEEE Transactions on Software Engineering* 49, no. 5 (2023): 3241-3260.
2. Khokhlov, Igor, Sergei Chuprov, and Leon Reznik. "Integrating Security with Accuracy Evaluation in Sensors Fusion." In *2022 IEEE Sensors*, pp. 1-4. IEEE, 2022.
3. Chuprov, Sergei, Leon Reznik, Igor Khokhlov, and Karan Manghi. "Multi-Modal Sensor Selection with Genetic Algorithms." In *2022 IEEE Sensors*, pp. 1-4. IEEE, 2022.
4. Khokhlov, Igor, Ahmet Okutan, Ryan Bryla, Steven Simmons, and Mehdi Mirakhorli. "Automated Extraction of Software Names from Vulnerability Reports using LSTM and Expert System." In *2022 IEEE 29th Annual Software Technology Conference (STC)*, pp. 125-134. IEEE, 2022.
5. Chuprov, Sergei, Igor Khokhlov, Leon Reznik, and Srujan Shetty. "Influence of transfer learning on machine learning systems robustness to data quality degradation." In *2022 International Joint Conference on Neural Networks (IJCNN)*, pp. 1-8. IEEE, 2022.

6. Fazelnia, Mohamad, Igor Khokhlov, and Mehdi Mirakhorli. "Attacks, defenses, and tools: A framework to facilitate robust AI/ML systems." arXiv preprint arXiv:2202.09465 (2022).
7. Chuprov, Sergei, Ilia Viksnin, Iuliia Kim, Timofey Melnikov, Leon Reznik, and Igor Khokhlov. "Improving knowledge based detection of soft attacks against autonomous vehicles with reputation, trust and data quality service models." In 2021 IEEE International Conference on Smart Data Services (SMDS), pp. 115-120. IEEE, 2021.
8. Khokhlov I., Reznik L., Chuprov S., "Framework for Integral Data Quality and Security Evaluation in Smartphones", in IEEE Systems Journal, DOI: 10.1109/JSYST.2020.2985343, 2020
9. Khokhlov I., Reznik L., Ajmera S., "Sensors in Mobile Devices Knowledge Base," in IEEE Sensors Letters, vol. 4, no. 3, pp. 1-4, March 2020, Art no. 5500404, doi: 10.1109/LENS.2020.2975161.
10. Alrubaye H., Mkaouer M.W., Khokhlov I., Reznik L., Ouni A., Mcgoff J., "Learning to Recommend Third-Party Library Migration Opportunities at the API Level", in Applied Soft Computing, Volume 90, 2020, 106140, ISSN 1568-4946, <https://doi.org/10.1016/j.asoc.2020.106140>.
11. Khokhlov I., Ligade N., Reznik L., "Recurrent Neural Networks for Colluded Applications Attack Detection in Android OS Devices", in 2020 International Joint Conference on Neural Networks (IJCNN), Glasgow, United Kingdom, 2020, pp. 1-8, doi: 10.1109/IJCNN48605.2020.9207339
12. Khokhlov I., Reznik L., Lyshevski S., "Adaptive Data Fusion in Inertial Sensors and Data Quality of Sensor Networks", 2020 IEEE 40th International Conference on Electronics and Nanotechnology (ELNANO), Kyiv, Ukraine, April 2020, DOI: 10.1109/ELNANO50318.2020.
13. Khokhlov I., Reznik L., "Knowledge Graph in Data Quality Evaluation for IoT Applications", in 2020 IEEE 6th World Forum on Internet of Things (WF-IoT), New Orleans, LA, USA, 2020, pp. 1-6, doi: 10.1109/WF-IoT48130.2020.9221091. **Received Outstanding Student Paper award.**
14. Chuprov S., Marinenkov E., Viksnin I., Reznik L., Khokhlov I., "Image Processing in Autonomous Vehicle Model Positioning and Movement Control", in 2020 IEEE 6th World Forum on Internet of Things (WF-IoT), New Orleans, LA, USA, 2020, pp. 1-6, doi: 10.1109/WF-IoT48130.2020.9221258.
15. Khokhlov I., Reznik L., "What is the Value of Data Value in Practical Security Applications", in 2020 IEEE Systems Security Symposium (SSS), Crystal City, VA, USA, 2020, pp. 1-8, doi: 10.1109/SSS47320.2020.9174457.
16. Chuprov S., Viksnin I., Kim I., Reznik L., Khokhlov I., "Reputation and Trust Models with Data Quality Metrics for Improving Autonomous Vehicles Traffic Security and Safety", in 2020 IEEE Systems Security Symposium (SSS), Crystal City, VA, USA, 2020, pp. 1-8, doi: 10.1109/SSS47320.2020.9174269.
17. Khokhlov I., Perez M., Reznik L., "Machine Learning in Anomaly Detection: Example of Colluded Applications Attack in Android Devices", in 2019 18th IEEE International Conference On Machine Learning And Applications (ICMLA), Boca Raton, FL, USA, 2019, pp. 1328-1333, doi: 10.1109/ICMLA.2019.00216.
18. Khokhlov I., Reznik L., Bhaskar R., "The Machine Learning Models For Activity Recognition Applications With Wearable Sensors", in 2019 18th IEEE International Conference On Machine Learning And Applications (ICMLA), Boca Raton, FL, USA, 2019, pp. 387-391, doi: 10.1109/ICMLA.2019.00072.
19. Khokhlov I., Perez M., Reznik L., "System Signals Monitoring And Processing For Colluded Application Attacks Detection In Android OS", in 2019 IEEE Western New York Image and Signal Processing Workshop (WNYISPW), Rochester, NY, USA, 2019, pp. 1-5, doi: 10.1109/WNYIPW.2019.8923113..
20. Khokhlov I., Pudage A., Reznik L., "Sensor Selection Optimization with Genetic Algorithms", in 2019 IEEE SENSORS, Montreal, QC, Canada, 2019, pp. 1-4, doi: 10.1109/SENSORS43011.2019.8956579.

21. Khokhlov I., Li Q., Reznik L., “D.I.F.E.N.S.E.: Distributed Intelligent Framework for Expendable Android Security Evaluation”, in “The 14th Annual Symposium on Information Assurance (ASIA '19)”, Albany, NY, USA, June 2019 (pp. 18-27).
22. Khokhlov I., Jain C., Miller-Jacobson B., Heyman A., Reznik L., St.Jacques R., “MeetCI: A Computational Intelligence Software Design Automation Framework”, 2018 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), Rio de Janeiro, 2018, pp. 1-8, doi: 10.1109/FUZZ-IEEE.2018.8491664.
23. Killawala A., Khokhlov I., Reznik L., “Computational Intelligence Framework for Automatic Quiz Question Generation”, in 2018 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), Rio de Janeiro, 2018, pp. 1-8, doi: 10.1109/FUZZ-IEEE.2018.8491624.
24. Khokhlov I., Reznik L., Cappos J. and Bhaskar R., “Design of activity recognition systems with wearable sensors”, in 2018 IEEE Sensors Applications Symposium (SAS), Seoul, 2018, pp. 1-6, doi: 10.1109/SAS.2018.8336752.
25. Vora A., Reznik L. Khokhlov I., “Mobile road pothole classification and reporting with data quality estimates”, in 2018 Fourth International Conference on Mobile and Secure Services (MobiSecServ), Miami Beach, FL, 2018, pp. 1-6, doi: 10.1109/MOBISECSERV.2018.8311437.
26. Khokhlov I., Reznik L., “Android System Security Evaluation”, in 2018 15th IEEE Annual Consumer Communications & Networking Conference (CCNC), Las Vegas, NV, 2018, pp. 1-2, doi: 10.1109/CCNC.2018.8319325.
27. Khokhlov I., Reznik L., Jothilingam S.B., “What Can Data Analysis Recommend on Design of Wearable Sensors?”, in 2018 15th IEEE Annual Consumer Communications & Networking Conference (CCNC), Las Vegas, NV, 2018, pp. 1-2, doi: 10.1109/CCNC.2018.8319288.
28. Khokhlov I., Reznik L., “Colluded Applications Vulnerabilities in Android Devices”, in 2017 IEEE 15th Intl Conf on Dependable, Autonomic and Secure Computing, 15th Intl Conf on Pervasive Intelligence and Computing, 3rd Intl Conf on Big Data Intelligence and Computing and Cyber Science and Technology Congress(DASC/PiCom/DataCom/CyberSciTech), Orlando, FL, 2017, pp. 462-469, doi: 10.1109/DASC-PiCom-DataCom-CyberSciTec.2017.89.
29. Khokhlov I., Reznik L., Kumar A., Mookherjee A. and Dalvi R., “Data Security and Quality Evaluation Framework: Implementation Empirical Study on Android Devices.”, in 2017 20th Conference of Open Innovations Association (FRUCT), St. Petersburg, 2017, pp. 161-168, doi: 10.23919/FRUCT.2017.8071307.
30. Khokhlov I., Reznik L., “Data Security Evaluation for Mobile Android Devices.”, in 2017 20th Conference of Open Innovations Association (FRUCT), St. Petersburg, 2017, pp. 154-160, doi: 10.23919/FRUCT.2017.8071306.

Webinar

1. Reznik L. and Khokhlov I., 2018. Trusted CI Webinar organized by the National Center for Supercomputing Applications at University of Illinois at Urbana-Champaign under auspices of NSF: “Data Quality & Security Evaluation Framework Development with Leon Reznik & Igor Khokhlov”. Accessible at: <http://hdl.handle.net/2142/99558> , <https://youtu.be/nkpokvJvTWw>

Invited Talks and Presentations to the Professional Conferences

1. “Smartphone Security Evaluation in the Era of Big Data” Igor Khokhlov, Leon Reznik. Rochester Security Summit 2019, Oct 2-3, 2019, Rochester, NY.
2. “Is your phone secure enough? Can it produce quality data?” Igor Khokhlov, Leon Reznik. ISACA WNY 2019 Control and Compliance Conference, May 7, 2019, Rochester, NY.
3. “What is Android Colluded Applications Attack and How to Detect It?” Igor Khokhlov, Leon Reznik. Rochester Security Summit 2018, Oct 9-10, 2018, Rochester, NY.

4. “Is my smartphone secure enough?” Qiaoran Li, Igor Khokhlov, Leon Reznik, Great Lakes Security Day 2018, Sep. 14, 2018 at Rochester Institute of Technology.
5. “Our work in AI and security: from data quality and security research to intelligent systems education” Leon Reznik, Igor khokhlov. [RIT-AI] Rochester Institute of Technology, Jan. 29, 2018.
6. “Data quality and security evaluation cyberinfrastructure applications” Leon Reznik, Igor Khokhlov, TTP 2018, April 17, 2018, New York, New York. Organized by Internet2, Under the auspices of NSF.

Posters

1. “Data Quality and Security Evaluation Toolset” Igor Khokhlov, Leon Reznik. The 2019 University Technology Showcase, April 4, 2019, Rochester, NY.
2. “Colluded Applications in Android OS and Ways of Their Detection” Igor Khokhlov, Leon Reznik, Great Lakes Security Day 2018, Rochester Institute of Technology, September 14, 2018.
3. “Intelligent Security Systems: Course curriculum development”, Leon Reznik, Igor Khokhlov, Cybersecurity Education Workshop 2018, April 23 – April 24 in South Lake Tahoe, CA., (<http://cis1.towson.edu/~cyber4all/index.php/cybered-2018/>).
4. “Intelligent Security Systems: Course curriculum development”, Great Lakes Security Day 2017, Rochester Institute of Technology, September 22, 2017, Leon Reznik, Igor Khokhlov.
5. “From security assessment to data veracity and privacy evaluation”, Great Lakes Security Day 2017, Rochester Institute of Technology, September 22, 2017, Igor Khokhlov, Leon Reznik.
6. “Intelligent Security Systems: Course curriculum development”, Leon Reznik, Igor Khokhlov, Cybersecurity Education Workshop 2017, August 7th & 8th, Baltimore - Maryland, (<http://cis1.towson.edu/~cyber4all/index.php/cybered-2017/>).
7. “Sensor Data Collection and Quality Evaluation Framework”. GCCIS Research Showcase. Rochester Institute of Technology, April 28, 2017. Igor Khokhlov, Leon Reznik.
8. “Sensor Data Collection and Quality Evaluation Framework”. One-day retreat at RIT on Artificial Intelligence. Rochester Institute of Technology, February 17, 2017. Igor Khokhlov, Leon Reznik.

External Awards

1. (2016-2020) **National Science Foundation scholarship**
2. (2020) **Outstanding Student Paper award** at 2020 IEEE World Forum on Internet of Things, New Orleans, Louisiana, USA, April 2020.
3. (2020) **IEEE Student Complimentary Registration Grant** at IEEE World Congress on Computational Intelligence (WCCI) 2020, Glasgow, UK, July 2020.

Developed Software (Android OS Apps with 655 total installs)

1. **(January 2019) Road Pothole Reporter** (45 installs)
<https://play.google.com/store/apps/details?id=sdh.application.reportthepotholes>
2. **(December 2018) Smartphone Data Collection Tool** (447 installs)
<https://play.google.com/store/apps/details?id=com.dataqualitylab.collectinfo.collectinfo>
3. **(November 2018) System Security Evaluation: Cloud Version** (14 installs)
<https://play.google.com/store/apps/details?id=com.igorkh.trustcheck.securitycheckcloud>
4. **(September 2018) System Security Evaluation** (67 installs)
<https://play.google.com/store/apps/details?id=com.igorkh.trustcheck.securitycheck>
5. **(March 2018) Detector of Unverified Apps** (82 installs)
https://play.google.com/store/apps/details?id=dataqualitylab.rit.ver_app_finder

Work experience

Aug. 2021 - present **Assistant Professor (Cybersecurity) at the School of Computer Science and Engineering at Sacred Heart University, Connecticut**

2020 - 2021 Postdoctoral Research Scientist at the Department of Software Engineering, Rochester Institute of Technology, New York

- A Novel Vulnerability Intelligence Platform (NVIP) - funded by the Department of Homeland Security (Contract number 70RSAT19CB0000020):
 - Developing novel intelligent methods of CVEs reconciliation.
 - Participating in the development of novel intelligent methods of CVEs categorization.
- Developing a comprehensive knowledge base of threats to Artificial Intelligence and Machine Learning algorithms:
 - Investigating and analyzing the threats to AI/ML algorithms
 - Researching weaknesses of data mining algorithms
 - Researching mitigation strategies
 - Mapping threats, attacks, and weaknesses to the mitigation strategies

2016 - 2020 Research Assistant, Department of Computer Science, Rochester Institute of Technology, New York

- Framework for data quality and security evaluation project - funded by NSF (award # ACL-1547301):
 - Developing a security evaluation method for Android OS based devices.
 - Investigating and analyzing colluded applications vulnerabilities in Android OS based devices.
- Intelligent Security Systems curriculum development project - funded by NSA (award # H98230-I7-l-0200):
 - Investigating the current state of intelligent security systems.
 - Developed presentation and teaching curriculum materials.

Summer 2018 Adjunct Faculty, Department of Computer Science, Rochester Institute of Technology, New York

- Course preparation and delivery as an independent instructor. Graduate-level course for Master of Science in Computer Science "Foundations of Intelligent Systems".

2013 - 2015 Android Application Developer, Embedded electronics team leader, JNI and JNA technologies consultant, Dynamo Development (<http://dynamo-ny.com/>)

- Android library for communication with the remote server that receives information from smart home's sensors.
- Android application for smart home sensors setup and control with remote communication.
- Android application for communication with Z-Wave wireless sensors.

2008 - 2013 Application Developer (Android, Windows), EDAPS, JSC "KP OTI".

- Android application for reading driver license data with NFC.
- Android application for reading vehicle technical passports with NFC.
- Android application for remote RFID reader (Blueberry) control.
- Android client and Windows server that converts Android devices with NFC to a contactless smart-card reader.
- Windows library for vehicle's technical state inspection card personalization.

Volunteer experience

- Guest Speaker, Fairchild-Nichols Memorial Library, Hamden, CT. (January 31, 2023).
- Guest Speaker, Hamden Public Library, Hamden, CT. (November 30, 2022).
- Guest Speaker, Hamden Public Library, Hamden, CT. (November 17, 2021).
- Volunteer Mentor at ASA DataFest at Rochester Institute of Technology, April 15, 2018
<https://ww2.amstat.org/education/datafest/>

Review experience

- (February 2023) Journal: Internet of Things; Engineering Cyber Physical Human Systems Journal.
- (February 23, 2022) Task Force Member, Clark.center.
- (December 2021) Journal: Journal of Data and Information Quality.
- (May 2019) Journal: Pervasive and Mobile Computing (ELSEVIER)
- (June 2018) 2018 IEEE Military Communications Conference (MILCOM)
- (August 2020) Journal: PLOS ONE

Additional training - Online courses

Jan. 2016 - March 2016	<i>Stanford University, Machine Learning, (coursera.org/verify/EU872EPPUUG6)</i>
Feb. 2014 - March 2014	<i>University of Maryland, College Park, Coursera.org, Programming Mobile Applications for Android Handheld Systems</i>
Feb. 2013 - March 2013	<i>Intuit.ru, "Introduction to application development for Android smartphones with Intel CPU".</i>
June. 2013-July 2013	<i>University of London, Coursera.org, "Creative Programming for Digital media & Mobile Apps".</i>

Teaching experience

Graduate-level Teaching	• Foundations Of Intelligent Systems (Rochester Institute Of Technology.) • Intro To Cyber Security (Sacred Heart University). • System Security (Sacred Heart University). • Special Topics: Cybersecurity (Sacred Heart University).
Undergraduate-level Teaching	• Cybersecurity Explorations (Sacred Heart University). • Web Development In Unix (Sacred Heart University). • Foundations Of Cybersecurity (Sacred Heart University). • Software & System Security (Sacred Heart University). • Cybersecurity Capstone I (Sacred Heart University). • Cybersecurity Capstone Ii (Sacred Heart University). • Computer Systems (Rochester Institute Of Technology) • Objective Oriented Programming (National Technical University Of Ukraine "Kyiv Polytechnic Institute")
Course preparation	• Took part at developing undergraduate-level course "Intelligent Security Systems" funded by NSA (award #H98230-I7-I-0200) • Investigated the current state of intelligent security systems • Developed presentation and teaching curriculum materials
Teaching Training	• Completed "Teaching skills" training during my master's program at the National Technical University of Ukraine "Kyiv Polytechnic Institute" • Completed "Teaching skills" course at Rochester Institute of Technology • Attended PI's meetings and workshops on Cybersecurity Education during the development of the undergraduate-level course "Intelligent Security Systems" funded by NSA (award #H98230-I7-I-0200)
Mentoring	• Mentoring graduate and undergraduate students, which resulted in joint publications.