

## LIST OF PRODUCTS

### Summary:

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### Products:

#### Applications developed

- [1] **Igor Khokhlov, Leon Reznik** Sensor Selector- available at Google Play – see <https://play.google.com/store/apps/details?id=edu.rit.dataqualitylab.sensorselector>, ver. June 3, 2022
- [2] **Igor Khokhlov, Leon Reznik** System Security Evaluation application - available at Google Play – see <https://play.google.com/store/apps/details?id=com.igorkh.trustcheck.securitycheck> , ver. 1.5, February 16, 2021
- [3] **Sahil Ajimera, Igor Khokhlov, Leon Reznik** Sensor Quality Assessment - available at Google Play – see available at Google Play – see <https://play.google.com/store/apps/details?id=com.dataqualitylab.sensorquality>, ver. 1.1, January 20, 2020
- [4] **Igor Khokhlov, Leon Reznik** Road pothole reporter, - available at Google Play – see <https://play.google.com/store/apps/details?id=sdh.application.reportthepotholes>, ver. Jan. 9, 2020
- [5] **Igor Khokhlov, Leon Reznik** Smartphone Data Collection Tool, - available at Google Play – see <https://play.google.com/store/apps/details?id=com.dataqualitylab.collectinfo.collectinfo>, ver. 1.11, December 7, 2018
- [6] **Igor Khokhlov, Leon Reznik** System Security Evaluation: Cloud version - available at Google Play – see <https://play.google.com/store/apps/details?id=com.igorkh.trustcheck.securitycheckcloud>, ver. 1, November 1, 2018
- [7] **Igor Khokhlov, Milan Bhaskar, Leon Reznik** Detector of Unverified Apps - available at Google Play – see [https://play.google.com/store/apps/details?id=dataqualitylab.rit.ver\\_app\\_finder](https://play.google.com/store/apps/details?id=dataqualitylab.rit.ver_app_finder), updated March 12, 2018
- [8] **Milan Bhaskar, Igor Khokhlov, Leon Reznik** Unverified App Finder - available at Google Play – see [https://play.google.com/store/apps/details?id=project.afinal.rit.capstone\\_milans\\_app](https://play.google.com/store/apps/details?id=project.afinal.rit.capstone_milans_app), updated March 2, 2018

#### Data collections

- [9] Sensors incorporated in mobile devices, their characteristics and quality evaluation, 2018 - 21 – available at <http://www.dataqualitylabs.com/downloadDataFor/Sensor%20Info>
- [10] Personal smartphones security evaluation, 2018-20 – available at <http://www.dataqualitylabs.com/downloadDataFor/Security%20Info>

#### Patent pending applications:

- [1] **L. Reznik, S. Chuprov, R. Zatsarenko** `` Federated Learning with A Compromised Unit Exclusion from Receiving Global Model Updates". *Application No. 63/439,995 filed on January 19, 2023, transferred to non-provisional in Jan. 2024- pending*
- [2] **L. Reznik and S. Chuprov**, ``Network Adjustment based on Machine Learning End System Performance Monitoring Feedback". *Application No. 63/406,514 filed on September 14, 2022- transferred to non-provisional in Sep. 2023- pending*

## Publications:

### Books

- [1] **L. Reznik** Intelligent security systems: How artificial intelligence, machine learning and data science work for and against computer security. IEEE Press-Wiley&Sons, ISBN-13: 978-1119771531, ISBN-10: 1119771536, 2022
- [2] **L. Reznik and Popescu M./Eds.** Proceedings of 4th International conference on wireless and mobile communications 2008 (ICWMC 2008), 27 July - 1 August 2008, Athens, Greece, IEEE 2008, ISBN CD:978-0-7695-3274-5, doi: 10.1109/ICWMC.2008.
- [3] **L.Reznik/Ed.** *Advancing Computing and Information Sciences*. RIT Cary Graphic Arts Press, 2005, ISBN 1-933360-05-4
- [4] **L.Reznik, V.Kreinovich/Eds.** *Soft Computing in Measurement and Information Acquisition*, Springer Verlag, Heidelberg-New York, 2003, ISBN 3-540-00246-4, 284 pp.
- [5] **L.Reznik, V.Dimitrov, J.Kacprzyk/Eds.** *Fuzzy System Design: Social and Engineering Applications*, Physica Verlag, Heidelberg-New York, 1998, ISBN 3-7908-1118-1, 334 pp.
- [6] **L.Reznik** *Fuzzy Controllers* Elsevier-Newnes, Oxford-Boston, 1997, ISBN 0-7506-3429-4, 287 pp.

### Chapters in Books

- [7] **L. Reznik**, "Computer Security with Artificial Intelligence, Machine Learning, and Data Science Combination," in *Intelligent Security Systems: How Artificial Intelligence, Machine Learning and Data Science Work For and Against Computer Security* , IEEE, 2022, pp.1-56, doi: 10.1002/9781119771579.ch1.
- [8] **L. Reznik**, "Firewall Design and Implementation," in *Intelligent Security Systems: How Artificial Intelligence, Machine Learning and Data Science Work For and Against Computer Security* , IEEE, 2022, pp.57-108, doi: 10.1002/9781119771579.ch2.
- [9] **L. Reznik**, "Intrusion Detection Systems," in *Intelligent Security Systems: How Artificial Intelligence, Machine Learning and Data Science Work For and Against Computer Security* , IEEE, 2022, pp.109-176, doi: 10.1002/9781119771579.ch3.
- [10] **L. Reznik**, "Malware and Vulnerabilities Detection and Protection," in *Intelligent Security Systems: How Artificial Intelligence, Machine Learning and Data Science Work For and Against Computer Security* , IEEE, 2022, pp.177-246, doi: 10.1002/9781119771579.ch4.
- [11] **L. Reznik**, "Hackers versus Normal Users," in *Intelligent Security Systems: How Artificial Intelligence, Machine Learning and Data Science Work For and Against Computer Security* , IEEE, 2022, pp.247-313, doi: 10.1002/9781119771579.ch5.
- [12] **L. Reznik**, "Adversarial Machine Learning," in *Intelligent Security Systems: How Artificial Intelligence, Machine Learning and Data Science Work For and Against Computer Security* , IEEE, 2022, pp.315-335, doi: 10.1002/9781119771579.ch6.
- [13] **L. Reznik**, "Front Matter," in *Intelligent Security Systems: How Artificial Intelligence, Machine Learning and Data Science Work For and Against Computer Security* , IEEE, 2022, pp.i-xxvi, doi: 10.1002/9781119771579.fmatter.
- [14] **L. Reznik** *Measurement Theory and Uncertainty in Measurements: Application of Interval Analysis and Fuzzy Sets Methods* In: Handbook of Granular Computing /Ed: W. Pedrycz, A.Skowron and V.Kreinovich , Wiley and Sons , Chichester, England, 2008, ISBN 978-0-470-03554-2, pp.517-532

- [15] **Von Pless G., Al Karim T., and Reznik L.** *Modified Time-Based Multilayer Perceptron for Sensor Networks and Image Processing Applications*. In *Advancing Computing and Information Sciences*. Reznik L. /Eds. RIT Cary Graphic Arts Press, pp. 27-33, 2005, ISBN 1-933360-05-4
- [16] **Yampolskiy R., Novikov D., and Reznik L.** *Performance of MLP and RBF in Character Recognition Utilizing Fuzzy Zoning Feature*. In *Advancing Computing and Information Sciences*. Reznik L. /Eds. RIT Cary Graphic Arts Press, 2005, pp. 34-41, ISBN 1-933360-05-4
- [17] **Samant A., Reznik L., Carithers W.** *Using System Call Analysis to Stop Evasion Attacks*. In *Advancing Computing and Information Sciences*. Reznik L. /Eds. RIT Cary Graphic Arts Press, 2005, ISBN 1-933360-05-4
- [18] **L.Mari and L.Reznik** *Uncertainty in Measurement: Some Thoughts about its Expressing and Processing* In L.Reznik and V.Kreinovich/Eds. *Soft Computing in Measurement and Information Acquisition*, Springer, Berlin-Heidelberg-New York, 2003, ISBN 3-540-00246- 4, pp. 1-9
- [19] **L.Reznik** *General Principles and Purposes of Computational Intelligence in Systems Science and Cybernetics*, [Ed. F. Parra-Luna], In: Encyclopedia of Life Support Systems, Developed under the Auspices of the UNESCO, EOLSS Publishers, Oxford, UK, 2003 (available on-line at <http://www.eolss.net/>)
- [20] **L.Reznik** *Neuro-Fuzzy Control Applications: Looking for New Areas and Techniques?* In: Fuzzy Logic: A Framework for the New Millennium Korotkich V. and V.Dimitrov/Eds. Physica Verlag, Heidelberg – New York, 2002, ISBN 3-7908-1425-3, p.337 - 351
- [21] **G. Solopchenko, V.Kreinovich, L.Reznik** *Development of Mathematical Structure of the Modern Measurement Science* In: Measurement Science - a Discussion, K.Kariya and L. Finkelstein /Eds. Ohmsha Ltd. and IOS Press, Amsterdam, Oxford, Tokyo, Washington, 2000, ISBN 4-274-90398-2 and 1-58603-088-4, p.23-36
- [22] **L. Reznik** *What Is Intelligent Measurement?* In: Computing with Words in Information /Intelligent Systems, L.A. Zadeh and J.Kacprzyk/Eds. Physica Verlag, Heidelberg – New York, 1999, ISBN 3-7908-1217-X, p.78 - 89
- [23] **L.Reznik** *Fuzzy Controller Design for Different Applications: Evolution, Methods, and Practical Recommendations* In: *Fuzzy System Design: Social and Engineering Applications*, L. Reznik, V.Dimitrov, J.Kacprzyk/Eds. Physica Verlag, Heidelberg- New York, 1998, p.185-201
- [24] **O.Ghanayem and L. Reznik** *A Universal Approach to Adaptive Fuzzy Logic Controller Design With an Application to a Power Generator Excitation Control* In: *Fuzzy System Design: Social and Engineering Applications*, L. Reznik, V.Dimitrov, J.Kacprzyk/Eds. Physica Verlag, Heidelberg – New York, 1998, p. 287-308
- [25] **L.Reznik** *Intelligent Measurement: How to Achieve?* In: Gorodetsky A.E. and Kurbanov V.G./Eds. *Physical Metrology: Theory and Application Aspects*, St.Petersburg, KN Publishers, 1996, pp.86 - 106 (in English and Russian)

#### Journal articles (refereed)

- [26] **Sergei Chuprov, Raman Zatsarenko, Leon Reznik, and Igor Khokhlov** (2024). Data Quality Based Intelligent Instrument Selection with Security Integration. ACM Journal of Data and Information Quality Vol. 16, Iss. 3, Article 15 (September 2024), 24 pages, doi: 10.1145/3695770
- [27] **Chuprov, S.; Belyaev, P.; Gataullin, R.; Reznik, L.; Neverov, E.; Viksnin, I.** Robust Autonomous Vehicle Computer-Vision-Based Localization in Challenging Environmental Conditions. *Appl. Sci.* 2023, *13*, 5735. Doi: 10.3390/app130957351.
- [28] **I. Khokhlov, L. Reznik and S. Chuprov**, “Framework for Integral Data Quality and Security Evaluation in Smartphones”, IEEE Systems Journal, June 2021, vol. 15, iss. 2, pp. 2058-2065, doi: 10.1109/JSYST.2020.2985343,

- [29] **I. Khokhlov, L. Reznik and S. Ajmera**, "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/LSENS.2020.2975161
- [30] **Alrubaye H. , Mkaouer M., Khokhlov, I., Reznik L., Ouni A., Mcgoff J.** Learning to recommend third-party library migration opportunities at the API level, *Applied Soft Computing*, vol. 90, pp.106-140, 2020
- [31] **A. Heyman, L.Reznik, M.Negnevitsky, A. Hoffman** Fuzzy System Design for Security and Environment Control Applications, *International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems*, Vol. 23, Suppl. 1 (December 2015), pp. 43-56
- [32] **K. K. Semenov, L. Reznik, and G. N. Solopchenko** Fuzzy Intervals Application for Software Metrological Certification in Measurement and Information Systems, *International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems*, Vol. 23, Suppl. 1 (December 2015), pp. 95–104
- [33] **L. Reznik, S.E. Lyshevski** Data Quality Indicators Composition and Calculus: Engineering and Information Systems Approaches, *Sensors & Transducers*, Vol. 185, Issue 2, February 2015, pp. 140-148 (also available online at [http://www.sensorsportal.com/HTML/DIGEST/february\\_2015/Vol\\_185/P\\_2612.pdf](http://www.sensorsportal.com/HTML/DIGEST/february_2015/Vol_185/P_2612.pdf))
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- [39] **L.Reznik and V.Kreinovich** *Fuzzy Models in Measurement*, *IEEE Transactions on Fuzzy Systems*, vol. 16, No.4, August 2008, pp. 851-862
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- [43] **A.Little and L.Reznik** *Improving the Approximation Smoothness of Radial Basis Neural Networks* *Journal of Advanced Computational Intelligence*, vol. 4, No. 6, 2000, pp.417-420
- [44] **L.Reznik, O. Gnanayem and A. Bourmistrov** *PID plus Fuzzy Controller Structures as a Design Base for Industrial Applications*, *Engineering Applications of Artificial Intelligence*, 2000, vol. 13, No.4, p. 419-430
- [45] **A.T. Popov, H. Nguyen, L.Reznik** *An Application of Fuzzy Mathematical Morphology to Interval-Valued Knowledge Representation: A Remark* *Reliable Computing*, 1998, No. 3, p. 283-290 - 20%
- [46] **L.Reznik** *Controller Design: The Combination of Techniques*, *Neural Network World*, 1996, vol. 6, No. 4, pp. 691 - 699

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- [48] **L.Reznik and J.Shi.** *Fuzzy Controller Design From A Practitioner's Point Of View - Membership Fuction Choice* , Australian Journal of Intelligent Information Processing Systems, 1995, vol.2, No.2, pp.38 - 46
- [49] **L. Reznik, G. Britov** *On Dynamics of Fuzzy Discrete Systems.* AUTOMATION AND REMOTE CONTROL, 1987, v. 48, 8, p.185-188
- [50] **L. Reznik** *Fuzzy Models of a priori Information in the Measurements' Results Processing* AMSE REVIEW, 1987, v.4, 2, p.1-12
- [51] **L. Reznik, G. Solopchenko** *The USSR Patent: Method of Complexing of Measurements*, BULLETIN OF PATENTS, 1986, No. 47
- [52] **L. Reznik, G. Solopchenko** *Use of a priori Information on Functional Relations between Measured Quantities for Improving Accuracy of Measurement.* MEASUREMENT, 1986, v.3, 2, p.61-69
- [53] **G.Britov and L. Reznik** *Optimal Control on the Linear Fuzzy Systems.* AUTOMATION AND REMOTE CONTROL, 1981, v.42, 4, p. 462-465

#### Conference Papers (peer reviewed)

- [54] Zatsarenko, R., Chuprov, S., Korobeinikov, D., & **Reznik, L.** (2024). "Trust-Based Anomaly Detection in Federated Edge Learning" in the Proceedings of the 2024 5<sup>th</sup> Annual IEEE World AI IoT Congress (AIIoT), Seattle, WA, USA, 29-31th May 2024, Eds.: R. Paul, A. Kundu, R. Bhattacharyya, pp. 273-279, doi: 10.1109/AIIoT61789.2024.10578967 – **won the BEST PRESENTER award**
- [55] Chuprov, S., Zatsarenko, R., Korobeinikov, D., & **Reznik, L.** (2024). "Robust Training on the Edge: Federated vs. Transfer Learning for Computer Vision in Intelligent Transportation Systems" in the Proceedings of the 2024 5<sup>th</sup> Annual IEEE World AI IoT Congress (AIIoT), Seattle, WA, USA, 29-31th May 2024, Eds.: R. Paul, A. Kundu, R. Bhattacharyya, pp. 172-178, doi: 10.1109/AIIoT61789.2024.10578970
- [56] Harshil Patel, Sergei Chuprov, Dmitrii Korobeinikov, Raman Zatsarenko and **Leon Reznik** "Improving Federated Learning Security with Trust Evaluation to Detect Adversarial Attacks" in of 19th Annual Symposium on Information Assurance (ASIA' 24) , June 4-5, 2024, Albany, NY /Eds. S. Goel
- [57] Dmitrii Korobeinikov, Sergei Chuprov, Raman Zatsarenko, and **Leon Reznik** "Federated Learning Robustness on Real World Data in Intelligent Transportation Systems" in Proceedings of 19th Annual Symposium on Information Assurance (ASIA' 24) , June 4-5, 2024, Albany, NY / Eds. S. Goel
- [58] **S. Chuprov, K. M. Bhatt and L. Reznik**, "Federated Learning for Robust Computer Vision in Intelligent Transportation Systems," 2023 IEEE Conference on Artificial Intelligence (CAI), Santa Clara, CA, USA, 2023, pp. 26-27, doi: 10.1109/CAI54212.2023.00019.
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- [61] **R. Zatsarenko, Marathe, C.A., Chuprov S, Hyland, M., & Reznik, L.** (2023). "Are Industrial ML Image Classifiers Robust to Data Affected by Network QoS Degradation?" in 2023 IEEE Western New York Image and Signal Processing Workshop (WNYISPW), 2023, pp. 1-4, doi: 10.1109/WNYISPW60588.2023.10349560. [URL](#)

- [62] **Chuprov, S., Reznik, L., & Grigoryan, G.** (2023). "Study on Network Importance for ML End Application Robustness" in ICC 2023 - IEEE International Conference on Communications, 2023, pp. 6627-6632, doi: 10.1109/ICC45041.2023.10279698. [URL](#)
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- [65] **S. Chuprov, A. N. Satam and L. Reznik**, "Are ML Image Classifiers Robust to Medical Image Quality Degradation?," *2022 IEEE Western New York Image and Signal Processing Workshop (WNYISPW)*, Rochester, NY, USA, 2022, pp. 1-4. doi: 10.1109/WNYISPW57858.2022.9983488
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- [68] **S. Chuprov, I. Viksnin, I. Kim, T. Melnikov, L. Reznik, I. Khokhlov** Improving Knowledge Based Detection of Soft Attacks Against Autonomous Vehicles with Reputation, Trust and Data Quality Service Models, IEEE World Congress on Services, Sep. 5-11, 2021, Chicago, IL, USA 2021 IEEE International Conference on Smart Data Services (SMDS), 2021, pp. 115-120, doi: 10.1109/SMDS53860.2021.00025
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- [75] **I. Khokhlov, L. Reznik and S. E. Lyshevski**, "Adaptive Data Fusion in Inertial Sensors and Data Quality Analysis of Sensor Networks," *2020 IEEE 40th International Conference on Electronics and Nanotechnology (ELNANO)*, Kyiv, Ukraine, 2020, pp. 430-435. doi: 10.1109/ELNANO50318.2020.9088859

- [76] **L.Reznik and I.Khokhlov.** From Data Communication to Delivery of Quality Data, Large Scale Networking (LSN) Workshop on Huge Data: A Computing, Networking and Distributed Systems Perspective, *Sponsored by the National Science Foundation (NSF)*, Chicago, IL, April 13 -- 14, 2020 available online at [https://drive.google.com/drive/folders/1\\_rzcvMv0jBGtZ8kvaelrXSZhOk4xgIz](https://drive.google.com/drive/folders/1_rzcvMv0jBGtZ8kvaelrXSZhOk4xgIz) accessed on Dec. 11, 2020
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- [205] **L. Reznik and I. Khokhlov Data Quality & Security Evaluation Framework Development** presented at the National Center for Supercomputing Applications at University of Illinois at Urbana-Champaign under auspices of NSF, on **March 26, 2018**, recordings available on the YouTube channel <https://www.youtube.com/watch?v=nkp0kvJvTWw&feature=youtu.be>. Also, you can download the corresponding [slides](#) are available at <https://www.ideals.illinois.edu/handle/2142/99558>
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### Reviews of my work

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