

List of papers: Ilya M. Safro

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Notation for Publications

ML¹ – Machine Learning/Data Mining, GA – Graph Algorithms/Network Science, NLP – Natural Language Processing/Text Mining, MS – Multiscale Methods, QC – Quantum Computing, CSC – Combinatorial Scientific Computing, AGT – Agent-based Modeling, BIO – Applications in Biology/Medicine/Healthcare, ENG – Applications in Computational Engineering, VIS – Visualization, COMB – Other Combinatorics

Book Chapters

1. (CSC, GA) I. Safro, D. Ron, A. Brandt, “*Fast Multilevel Algorithms for Linear Ordering Problems*”, in “*Computational Optimization: New Research Developments*”, Nova Science Publishers, ISBN: 978-1-60692-671-0, 2010
2. (ML) P. Bhavsar, I. Safro, N. Bouayanaya, R. Polikar, D. Dera “*Chapter 12: Machine Learning in Transportation Data Analytics*”, a book chapter in “*Data analytics for intelligent transportation systems*”, A. Apon, R. Chowdhury, K. Dey eds., 2017
3. (GA) Manuel Penschuck, Ulrik Brandes, Michael Hamann, Sebastian Lamm, Ulrich Meyer, Ilya Safro, Peter Sanders, Christian Schulz “*Recent Advances in Scalable Network Generation*”, a chapter in “*Massive Graph Analytics*”, David Bader ed., Chapman and Hall/CRC, ISBN:978-0-36746-412-7, preprint at <https://arxiv.org/abs/2003.00736>, 2020

Journal Publications

The underlined co-authors are either my current or former students and completed a project or its major part before graduating.

4. **INVITED PAPER** (AGT,BIO) Ilya Safro, Lee Segel, “*Collective stochastic versions of playable games as metaphors for complex biosystems: Team Collect Four*”, **Complexity** 8 (2003), 46-55, [download](#)
5. (GA,CSC,MS) I. Safro, D. Ron, A. Brandt, “*A Multilevel Algorithm for the Minimum 2-sum Problem*”, **Journal of Graph Algorithms and Applications**, Vol. 10/2, 2006, [download](#)
6. **IN SCIENCE DIRECT TOP-25 ARTICLES 2006** (GA,CSC,MS) I. Safro, D. Ron, A. Brandt, “*Graph Minimum Linear Arrangement by Multilevel Weighted Edge Contractions*”, **Journal of Algorithms**, Vol. 60/1, pp. 24-41, 2006, [download](#)
7. (BIO) L. Klipcan, I. Safro, B. Temkin, M. Safro, “*Optimal growth temperature of prokaryotes correlates with class II amino acid composition*”, **FEBS Letters**, Vol. 580/6, pp. 1672-1676, 2006, [download](#)
8. (GA,CSC,MS) I. Safro, D. Ron, A. Brandt, “*Multilevel Algorithms for Linear Ordering Problems*”, **ACM Journal of Experimental Algorithmics**, Vol. 13, pp. 1.4-1.20, 2008, [download](#)
9. (GA,CSC) E. Boman, U. Catalyurek, C. Chevalier, K. Devine, I. Safro, M. Wolf, “*Advances in Parallel Partitioning, Load Balancing, and Matrix Ordering*”, **Journal of Physics**, Vol. 180, 2009, [download](#)

¹Due to heavy abuse and inconsistency in understanding of the term “AI” by the media and some scientists, I prefer to clarify the specific sub-areas of AI using ML, NLP, BIO, ENG, and partially GA. In fact, most of my works marked by ML, NLP, BIO, ENG, and some of GA are tasks of AI. Depending on the task, deep learning, neural nets and representation learning belong to some of these classes.

10. (CSC,MS,VIS) D. Ron, I. Safro, A. Brandt, “A fast multigrid algorithm for energy minimization under planar density constraints”, **SIAM Multiscale Modeling and Simulation**, Vol. 8, No. 5, pp. 1599-1620, 2010, [download](#)
11. (GA,MS,CSC) D. Ron, I. Safro, A. Brandt, “Relaxation-based coarsening and multiscale organization of graphs”, **SIAM Multiscale Modeling and Simulation**, Vol. 9, No. 1, pp. 407-423, 2011, [download](#)
12. (GA,CSC) J. Chen, I. Safro, “Algebraic Distance on Graphs”, **SIAM Journal on Scientific Computing**, Vol. 33, No. 6, pp. 3468-3490, 2011, [download](#)
13. (GA,MS,CSC) I. Safro, B. Temkin, “Multiscale approach for network compression-friendly ordering”, **Journal of Discrete Algorithms**, Vol. 9, pp. 190-202, 2011, [download](#).
14. (CSC) A. Lyons, I. Safro, J. Utke, “Randomized algorithms for Exploiting Jacobian Scarcity”, **Optimization Methods and Software** 27(2), pp. 311-322, 2012, [download](#).
15. (GA,MS) S. Leyffer, I. Safro “Fast Response to Infection Spread and Cyber Attacks on Large-Scale Networks”, **Journal of Complex Networks**, vol 1(2), pp. 183–199, 2013, [download](#)
16. (GA) N. Goldberg, S. Leyffer, I. Safro “Optimal Response to Cyber Attacks and Epidemics in Networks”, **Networks**, Volume 66 (2), pp. 145–158, 2015, [download](#)
17. (GA,MS,CSC) I. Safro, P. Sanders, C. Schultz “Advanced Coarsening Schemes for Graph Partitioning”, **ACM Journal of Experimental Algorithms**, vol. 19, pp. 2.2:1–2.2:24, 2015, [download](#)
18. (ML,MS,BIO) T. Razzaghi, O. Roderick, I. Safro, N. Marko “Multiscale weighted support vector machines for classification of healthcare data with missing values”, **PLOS ONE**, Volume 11(5), 2016, [download](#).
19. (GA) A. Buluc, H. Meyerhenke, I. Safro, P. Sanders, C. Schulz “Recent Advances in Graph Partitioning”, LNCS 9220 volume on **Algorithms Engineering: Selected Results and Surveys**, 2016, Preprint at Arxiv [download](#).
20. (GA,MS) Emmanuel John, Ilya Safro “Single- and Multi-level Network Sparsification by Algebraic Distance”, **Journal of Complex Networks**, Volume 3 (5), pp. 352–388, 2016, [download](#)
21. (GA) Christian L. Staudt, Michael Hamann, Alexander Gutfraind, Ilya Safro, Henning Meyerhenke “Generating realistic scaled complex networks”, **Applied Network Science**, vol. 2(1), 36p, 2017, <https://doi.org/10.1007/s41109-017-0054-z>, Springer
22. (GA,CSC,MS) J. Hungerford, W. Hager, I. Safro “A Multilevel Bilinear Programming Algorithm for the Vertex Separator Problem”, **Computational Optimization and Applications**, vol. 69, issue 1, pp. 189-223, 2018, <https://doi.org/10.1007/s10589-017-9945-2>, preprint at <https://www.eecis.udel.edu/~isafro/papers/mlvsp-coap.pdf>
23. (ML,BIO) T. Razzaghi, I. Safro, J. Ewing, E. Sadrifaridpour, J. Scott “Predictive Models for Bariatric Surgery Risks with Imbalanced Medical Datasets”, **Annals of Operations Research**, Vol. 280(1-2), pp. 1–18, 2019, <https://doi.org/10.1007/s10479-019-03156-8>, preprint at <https://www.eecis.udel.edu/~isafro/papers/bariatric-surgery.pdf>
24. (GA) H. Ushijima-Mwesigwa, MD Z. Khan, M. Chowdhury, I. Safro “Centralities for Networks with Consumable Resources”, **Network Science**, Vol. 7(3), pp. 376–401, 2019, <https://doi.org/10.1017/nws.2019.7>, preprint at <https://arxiv.org/abs/1903.00642>
25. (ML,ENG) MD Zaidid Khan, Mashrur Chowdhury, Sakib Mahmud Khan, Ilya Safro, Hayato Ushijima-Mwesigwa, “Wireless Charging Utility Maximization and Intersection Control Delay Minimization Framework for Electric Vehicles”, **Computer-Aided Civil and Infrastructure Engineering**, Vol. 34(7), <https://doi.org/10.1111/mice.12439>, preprint at <https://www.eecis.udel.edu/~isafro/papers/wireless-inters.pdf>, 2019
26. (QC,GA) **INVITED PAPER** Ruslan Shaydulín, Hayato Ushijima-Mwesigwa, Christian F.A. Negre, Ilya Safro, Susan M. Mniszewski, Yuri Alexeev “A Hybrid Approach for Solving Optimization Problems on Small Quantum Computers”, **IEEE Computer**, Vol. 52(6), pp. 18–26, 2019, <https://doi.org/10.1109/MC.2019.2908942>

27. (GA,MS) V. Chauhan, A. Gutfraind, I. Safro “*Multiscale Planar Graph Generator*”, **Applied Network Science**, Vol. 4(46), 2019, <https://doi.org/10.1007/s41109-019-0142-3>, preprint at <https://arxiv.org/abs/1802.09617>
28. (NLP,ML,BIO) Marina Aksenova, Justin Sybrandt, Biyun Cui, Vitali Sikirzhyski, Hao Ji, Diana Odhiambo, Mathew Lucius, Jill R. Turner, Eugenia Broude, Edsel Peña, Sofia Lizzaraga, Jun Zhu, Ilya Safro, Michael D Wyatt, Michael Shtutman “*Inhibition of the DDX3 prevents HIV-1 Tat and cocaine-induced neurotoxicity by targeting microglia activation*”, accepted in **Journal of Neuroimmune Pharmacology**, preprint at <https://doi.org/10.1101/591438>, 2019
29. (QC,GA,ML) R. Shaydulin, H. Ushijima-Mwesigwa, I. Safro, S. Mniszewski, Y. Alexeev “*Network Community Detection On Small Quantum Computers*”, **Advanced Quantum Technologies**, Vol. 2(9), <https://doi.org/10.1002/qute.201900029>, preprint at <https://arxiv.org/abs/1810.12484>, 2019
30. (ML,MS) E. Sadrfaridpour, T. Razzaghi, I. Safro “*Engineering fast multilevel support vector machines*”, **Machine Learning**, Volume 108(11), pp. 1879—1917, Springer, 2019, <https://doi.org/10.1007/s10994-019-05800-7>, preprint at <https://arxiv.org/abs/1707.07657>
31. (GA,CSC,MS) R. Shaydulin, J. Chen, I. Safro “*Relaxation-Based Coarsening for Multilevel Hypergraph Partitioning*”, **SIAM Multiscale Modeling and Simulation**, vol. 17, issue 1, pp. 482—506, 2019, preprint at <https://arxiv.org/abs/1710.06552>
32. (ML,ENG) William Locke, Justin Sybrandt, Ilya Safro, Sez Atamturktur, “*Using Drive-by Health Monitoring to Detect Bridge Damage Considering Environmental and Operational Effects*”, **Journal of Sound and Vibration**, vol. 468 (115088), preprint at <https://doi.org/10.31224/osf.io/ntfdp>, 2020
33. (ML,GA) Justin Sybrandt, Ruslan Shaydulin, Ilya Safro “*Hypergraph Partitioning with Embeddings*”, **IEEE Transaction on Knowledge and Data Engineering (TKDE)**, 2020, DOI 10.1109/TKDE.2020.3017120, preprint at <https://arxiv.org/abs/1909.04016>
34. (QC,MS) Hayato Ushijima-Mwesigwa, Ruslan Shaydulin, Christian Negre, Susan Mniszewski, Yuri Alexeev, Ilya Safro “*Multilevel Combinatorial Optimization Across Quantum Architectures*”, **ACM Transactions on Quantum Computing**, vol. 2, issue 1, 2021, <https://doi.org/10.1145/3425607>, preprint at <https://arxiv.org/abs/1910.09985>
35. (GA) Zirou Qiu, Ruslan Shaydulin, Xiaoyuan Liu, Yuri Alexeev, Christopher S. Henry, Ilya Safro “*EL-RUNA: Elimination Rule-based Network Alignment*”, **ACM Journal of Experimental Algorithmics**, vol. 26, pp. 1—32, <https://doi.org/10.1145/3450703>, 2021, preprint at <https://arxiv.org/abs/1911.05486>
36. (GA,ENG) Hayato Ushijima-Mwesigwa, MD Zaidid Khan, Mashrur Chowdhury, Ilya Safro “*Optimal Placement of Wireless Charging Lanes in Road Networks*”, **Journal of Industrial and Management Optimization**, vol. 17, issue 3, pp. 1315-1341, 2021, preprint at <https://www.eecis.udel.edu/~isafro/papers/optimal-wcl.pdf>
37. (GA,CSC,MS) Hayato Ushijima-Mwesigwa, Jeffrey D. Hyman, Aric Hagberg, Ilya Safro, Satish Karra, Carl W. Gable, Gowri Srinivasan “*Multilevel Graph Partitioning for Three-Dimensional Discrete Fracture Network Flow Simulations*”, **Mathematical Geosciences**, <https://doi.org/10.1007/s11004-021-09944-y>, preprint at <https://arxiv.org/abs/1902.08029>, 2021
38. (NLP,BIO) Justin Sybrandt, Ilya Safro “*CBAG: Conditional Biomedical Abstract Generation*”, **PLOS One**, vol. 16(7): e0253905, <https://doi.org/10.1371/journal.pone.0253905>, preprint at <https://arxiv.org/abs/2002.05637>, 2021
39. (QC) Ruslan Shaydulin, Stuart Hadfield, Tad Hogg, Ilya Safro “*Classical symmetries and Quantum Approximate Optimization Algorithm*”, **Quantum Information Processing**, vol. 20(11), DOI <https://doi.org/10.1007/s11128-021-03298-4>, preprint at <https://arxiv.org/pdf/2012.04713.pdf>, 2021
40. (QC) Xiaoyuan Liu, Anthony Angone, Ruslan Shaydulin, Ilya Safro, Yuri Alexeev, Lukasz Cincio “*Layer VQE: A Variational Approach for Combinatorial Optimization on Noisy Quantum Computers*”, **IEEE Transactions on Quantum Engineering**, vol. 3, pp. 1-20, preprint at <https://arxiv.org/abs/2102.05566>, 2022

41. (QC,GA) Xiaoyuan Liu, Hayato Ushijima-Mwesigwa, Avradip Mandal, Sarvagya Upadhyay, Ilya Safro, Arnab Roy “*Leveraging Special-Purpose Hardware for Local Search Heuristics*”, **Computational Optimization and Applications**, vol. 82, pp. 1–29, preprint at <https://arxiv.org/abs/1911.09810>, 2022
42. (GA, ENG) Ahmad Momeni, Varsha Chauhan, Abdulrahman Bin Mahmoud, Kalyan Piratla, Ilya Safro “*Generation of Synthetic Water Distribution Data Using a Multi-Scale Generator-Optimizer*”, **Journal of Pipeline Systems**, Vol. 14(1), 2023
43. (QC) Dylan Herman, Cody Googin, Xiaoyuan Liu, Yue Sun, Alexey Galda, Ilya Safro, Marco Pistoia, Yuri Alexeev “*Quantum Computing for Finance*”, accepted in **Nature Physics Reviews**, preprint will be available soon, 2023

Refereed Conferences (regular papers)

44. (GA,CSC,MS) C. Chevalier, I. Safro, “*Comparison of coarsening schemes for multilevel graph partitioning*”, **Learning and Intelligent Optimization (LION)** (acceptance rate 18%), LNCS 5851, pp. 191–205. Springer, 2009, [download](#)
45. (GA,CSC,MS) I. Safro, P. Hovland, J. Shin, M. Strout, “*Improving random walk performance*”, In Proceedings of the 2009 **International Conference on Scientific Computing (CSC)**, pp. 108–112, CSREA Press, 2009, [download](#)
46. (ML) O. Roderick, I. Safro, “*Learning Highly Filtered Data by Nonlinear Spectral Methods*”, **Learning and Intelligent Optimization (LION)** (acceptance rate 21%), LNCS 6073, pp. 154–168. Springer, 2010, [download](#)
47. (GA,CSC) J. Chen, I. Safro, “*A Measure of the Connection Strengths between Graph Vertices*”, **International Conference on Computational Science (ICCS)**, vol. 4, pp. 196–205, 2011
48. (GA,CSC,MS) I. Safro, P. Sanders, C. Schultz “*Advanced Coarsening Schemes for Graph Partitioning*”, **Symposium on Experimental Algorithms (SEA)**, LNCS vol. 776, pp. 369-380, 2012, [download](#)
49. (GA,CSC,MS) W. Hager, J. Hungerford, I. Safro, “*A Continuous Refinement Strategy for the Multilevel Computation of Vertex Separators*”, **Learning and Intelligent Optimization (LION)**, LNCS vol. 8426, pp. 77-81, 2014, [download](#)
50. (ML,MS) T. Razzaghi, I. Safro “*Scalable Multilevel Support Vector Machines*”, **International Conference on Computational Science (ICCS)**, Procedia Computer Science, Vol. 51, pp. 2683–2687, 2015, [download](#)
51. (ML,MS,BIO) T. Razzaghi, O. Roderick, I. Safro, N. Marko “*Fast Imbalanced Classification of Healthcare Data with Missing Values*”, In Proceedings of **IEEE International Conference on Information Fusion (FUSION)**, pp. 774–781, 2015, [download](#)
52. (GA,MS) A. Gutfraind, L. A. Meyers, I. Safro “*Multiscale Network Generation*”, In Proceedings of **IEEE International Conference on Information Fusion (FUSION)**, pp. 158–165, 2015, [download](#)
53. (GA) C. Staudt, M. Hamann, I. Safro, A. Gutfraind, and H. Meyerhenke “*Generating Scaled Replicas of Real-World Networks*”, **Complex Networks & Their Applications V (COMPLENET)**, 2016, Studies in Computational Intelligence, vol 693. Springer, [download](#)
54. (ML,MS) E. Sadrfaridpour, T. Razzaghi, A. Luckow, K. Kennedy, S. Jeeredy, I. Safro “*Algebraic multigrid-inspired support vector machines*”, **European Symposium on Artificial Neural Networks (ESANN17)**, [download](#), 2017
55. (NLP) (oral presentation, in top 8%; honorable mention for Audience Appreciation Award, in top 5 papers) J. Sybrandt, M. Shtutman, I. Safro “*MOLIERE: Automatic Biomedical Hypothesis Generation System*”, In Proceedings of the 23rd **ACM SIGKDD International Conference on Knowledge Discovery and Data Mining**, pp. 1633-1642, [download](#), 2017

56. (NLP) N.Avudaiappan, A. Herzog, S. Kadam, Y. Du, J. Thatcher, I. Safro “*Detecting and Summarizing Emergent Events in Microblogs and Social Media Streams by Dynamic Centralities*”, **IEEE International Conference on Big Data 2017 (BIGDATA)**, (acceptance rate 18%), long version at arXiv:1610.06431, [download](#), 2017
57. (ML,ENG) MD Z. Khan, M. A. Chowdhury, S. M. Khan, I. Safro, H. Ushijima-Mwesigwa “Utility Maximization Framework for Opportunistic Wireless Charging at Signalized Intersections: A Simulation-based Approach”, **Transportation Research Board**, 2017, [download](#)
58. (GA,CSC,MS) Ruslan Shaydulin, Ilya Safro “*Aggregative Coarsening for Multilevel Hypergraph Partitioning*”, in proceedings of the **17th International Symposium on Experimental Algorithms (SEA)**, Vol. 103, pp. 2:1-2:15, 10.4230/LIPIcs.SEA.2018.2, 2018, [download](#)
59. (QC,GA) Ruslan Shaydulin, Hayato Ushijima-Mwesigwa, Ilya Safro, Susan Mniszewski, Yuri Alexeev “Community Detection Across Emerging Quantum Architectures”, in proceedings of the **3rd International Workshop on Post Moore’s Era Supercomputing (PMES 2018)**, Supercomputing, preprint at arXiv:1810.07765, [download](#), 2018.
60. (NLP) Justin Sybrandt, Michael Shtutman, Ilya Safro “*Large-Scale Validation of Hypothesis Generation Systems via Candidate Ranking*”, In 2018 **IEEE International Conference on Big Data (Big Data)** (acceptance rate 18%), pp. 1494-1503, 2018, preprint at <https://arxiv.org/abs/1802.03793>
61. (NLP) Justin Sybrandt, Angelo Carrabba, Alexander Herzog, Ilya Safro “*Are Abstracts Enough for Hypothesis Generation?*”, In 2018 **IEEE International Conference on Big Data (Big Data)** (acceptance rate 18%), pp. 1504-1513, 2018, preprint at <https://arxiv.org/abs/1804.05942>
62. (ML) Saroj K. Dash, Ilya Safro, and Ravisutha Sakrepatna Srinivasamurthy “*Spatio-temporal prediction of crimes using network analytic approach*”, In 2018 **IEEE International Conference on Big Data (Big Data)** (acceptance rate 18%), pp. 1912-1917, 2018, [download](#)
63. **BEST STUDENT PAPER AWARD** (QC,GA) Ruslan Shaydulin, Ilya Safro, Jeffrey Larsen “Multi-start Methods for Quantum Approximate Optimization”, **IEEE High-Performance Extreme Computing (HPEC)**, preprint at <https://arxiv.org/abs/1905.08768>, 2019
64. (NLP) C. Gropp, A. Herzog, I. Safro, P. Wilson, A. Apon “*Clustered Latent Dirichlet Allocation for Scientific Discovery*”, **IEEE International Conference on Big Data (BIGDATA)**, 2019, preprint at <https://arxiv.org/abs/1610.07703>
65. (ML,GA) Justin Sybrandt, Ilya Safro “*FOBE and HOBE: First- and High-order Bipartite Embeddings*”, **16th International Workshop on Mining and Learning with Graphs, ACM SIGKDD International Conference on Knowledge Discovery and Data Mining 2020**, preprint at <https://arxiv.org/abs/1905.10953>
66. (ML,GA) Fei Ding, Xiaohong Zhang, Justin Sybrandt, Ilya Safro “*Unsupervised Hierarchical Graph Representation Learning by Mutual Information Maximization*”, **16th International Workshop on Mining and Learning with Graphs, ACM SIGKDD International Conference on Knowledge Discovery and Data Mining 2020**, preprint at <https://arxiv.org/abs/2003.08420>
67. (NLP) Justin Sybrandt, Ilya Tyagin, Michael Shtutman, Ilya Safro “*AGATHA: Automatic Graph-mining And Transformer based Hypothesis generation Approach*”, **29TH ACM International Conference on Information and Knowledge Management (CIKM)**, preprint at <https://arxiv.org/abs/2002.05635>, 2020
68. (ML, MS) Ehsan Sadrfaridpour, Korey Palmer, Ilya Safro “*AML-SVM: Adaptive Multilevel Learning with Support Vector Machines*”, In 2020 **IEEE International Conference on Big Data (BIGDATA)** (acceptance rate 15%), 2020, preprint at <https://arxiv.org/abs/2011.02592>
69. (NLP) Farah Alshani, Amy Apon, Alexander Herzog, Ilya Safro, Justin Sybrandt “*Accelerating Text Mining Using a Domain-Specific Stop Word List*”, In 2020 **IEEE International Conference on Big Data (BIG-DATA)** (acceptance rate 15%), pp. 2639-2648, DOI: 10.1109/BigData50022.2020.9378226, 2020

70. (NLP, BIO) Ilya Tyagin, Ilya Safro “*Interpretable Visualization of Scientific Hypotheses in Literature-based Discovery*”, **BioCreative VII Workshop**, preprint at <https://www.biorxiv.org/content/10.1101/2021.10.29.466471v1>, 2021
71. (QC, GA) Alexey Galda, Xiaoyuan Liu, Danylo Lykov, Yuri Alexeev, and Ilya Safro “*Transferability of optimal QAOA parameters between random graphs*”, **IEEE International Conference on Quantum Computing and Engineering (QCE)**, <https://doi.org/10.1109/QCE52317.2021.00034>, preprint at <https://arxiv.org/pdf/2106.07531.pdf>, 2021
72. (NLP, BIO) Ilya Tyagin, Ankit Kulshrestha, Justin Sybrandt, Krish Matta, Michael Shtutman, Ilya Safro “*Accelerating COVID-19 research with graph mining and transformer-based learning*”, **AAAI Innovative Applications of Artificial Intelligence (AAAI)**, Vol. 36(11), pp. 12673–12679, <https://doi.org/10.1609/aaai.v36i11.21543>, preprint at <https://www.biorxiv.org/content/10.1101/2021.02.11.430789v1>, 2022
73. (QC, GA) Xiaoyuan Liu, Hayato Ushijima-Mwesigwa, Indradeep Ghosh, and Ilya Safro. “*Partitioning Dense Graphs with Hardware Accelerators*”, **International Conference on Computational Science (ICCS)**, preprint at <https://arxiv.org/abs/2202.09420>, 2022
74. (ML, QC) Ankit Kulshrestha, Ilya Safro “*BEINIT: Avoiding Barren Plateaus in Variational Quantum Algorithms*”, **IEEE International Conference on Quantum Computing and Engineering (QCE)**, <https://doi.ieeecomputersociety.org/10.1109/QCE53715.2022.00039>, pp. 197–203, preprint at <https://arxiv.org/abs/2204.13751>, 2022
75. (QC, GA) Xiaoyuan Liu, Ruslan Shaydulin, Ilya Safro “*Quantum Approximate Optimization Algorithm with Sparsified Phase Operator*”, **IEEE International Conference on Quantum Computing and Engineering (QCE)**, <https://doi.org/10.1109/QCE53715.2022.00032>, preprint at <https://arxiv.org/abs/2205.00118>, 2022
76. **BEST STUDENT PAPER AWARD** (QC, GA) Cameron Ibrahim, Dan Lykov, Zichang He, Yuri Alexeev, Ilya Safro “*Constructing Optimal Contraction Trees for Tensor Network Quantum Circuit Simulation*”, **IEEE High Performance Extreme Computing (HPEC)**, DOI 10.1109/HPEC55821.2022.9926353, 2022, preprint at <https://arxiv.org/abs/2209.02895>
77. (ML, QC) Xiaoyuan Liu, Ilya Tyagin, Hayato Ushijima-Mwesigwa, Indradeep Ghosh, Ilya Safro “*Towards Practical Explainability with Cluster Descriptors*”, **International Conference on Data Mining (ICDM) Workshop on Optimization Based Techniques for Emerging Data Mining Problems (OEDM)**, <https://doi.ieeecomputersociety.org/10.1109/ICDMW58026.2022.00036>, preprint at <https://arxiv.org/pdf/2210.10662.pdf>, 2022
78. (NLP) Farah Alshaniq, Amy Apon, Yuheng Du, Alex Herzog, Ilya Safro “*Proactive Query Expansion for Streaming Data Using External Sources*”, **IEEE International Conference on Big Data (BIGDATA)**, pp. 701-708, DOI 10.1109/BigData55660.2022.10020577, preprint at <https://arxiv.org/pdf/2201.06592.pdf>, 2022

Under review or revision in journals/conferences

79. (ML) Ankit Kulshrestha, Ilya Safro “*CONFAIR: Configurable and Interpretable Algorithmic Fairness*”, submitted, preprint at <https://arxiv.org/abs/2111.08878>, 2022
80. (QC) Alexey Galda, Eesh Gupta, Jose Falla, Xiaoyuan Liu, Danylo Lykov, Yuri Alexeev, Ilya Safro “*Similarity-Based Parameter Transferability in Quantum Approximate Optimization Algorithm*”, submitted (2nd round, minor revision), 2023
81. (QC, ML) Ankit Kulshrestha, Xiayuan Liu, Hayato Ushijima-Mwesigwa, Ilya Safro “*QAdaPrune - An Adaptive Parameter Pruning Algorithm For Training Variational Quantum Circuits*”, submitted, 2023
82. (QC, ML) Ankit Kulshrestha, Xiayuan Liu, Hayato Ushijima-Mwesigwa, Ilya Safro “*Learning to Optimize Quantum Neural Networks Without Gradients*”, submitted, preprint at <https://arxiv.org/pdf/2304.07442.pdf>, 2023

Selected ArXiv/White Papers/Technical Reports

83. (NLP) I. Safro, "Discovery of new hypotheses about the relations between biological objects using MEDLINE information", 2000.
84. (GA) I. Safro, "The minimum linear arrangement problem on proper interval graphs", <https://arxiv.org/abs/cs/0608008>, 2002
85. (COMB) S. Benditkis, I. Safro, "Generalizations of the Hanoi Towers problem", arXiv, cs.DM/0612070, 1998, <https://arxiv.org/abs/cs/0612070>
86. (ML) O. Roderick, I. Safro, "Polynomial Interpolation for Predicting Decisions and Recovering Missing Data", Technical report ANL/MCS-P1586-0209, Argonne National Laboratory, [download](#).
87. (GA,MS) A. Gutfraind, I. Safro "Modeling and Generation of Complex Networks with Applications to Security", 2011.
88. (GA,MS) I. Safro "Multilevel methods for modeling large-scale networks", Argonne National Laboratory Technical Report ANL/MCS-2012-0112, 2011
89. (GA,MS) A. Gutfraind, L. A. Meyers, I. Safro "Multiscale Network Generation", Technical Report ANL/MCS-P3009-0712, 2012.
90. (GA,CSC) U. Meyer, H. Meyerhenke, A. Pinar, I. Safro "High-performance Graph Algorithms and Applications in Computational Science", Dagstuhl Reports, Vol. 4, Issue 11, pp. 40–58, 2014, [download](#)
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