

ANTON ALYAKIN

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EDUCATION

Washington University in St. Louis

Doctor of Medicine

One-Year Research without Degree Program (MD5)

[Aug 2021, May 2026]

(Expected)

Johns Hopkins University

Master of Science in Engineering

Applied Mathematics & Statistics

[Jan 2019, Dec 2019]

Johns Hopkins University

Bachelor of Science

Computer Science

Applied Mathematics & Statistics

[Aug 2015, May 2019]

RESEARCH

New York University

Visiting Medical Student Researcher

Department of Neurosurgery / OLAB

Faculty Supervisor: Eric K. Oermann

[Mar 2024, present]

Washington University in Saint Louis

Medical Student Researcher

Department of Neurosurgery / Leuthardt Lab

Faculty Supervisor: Eric Leuthardt

[Mar 2023, present]

Johns Hopkins University

Assistant Research Engineer

Department of Applied Mathematics & Statistics / Neruodata Lab

Faculty Supervisors: Carey E. Priebe & Joshua T. Vogelstein

[Jan 2020, Mar 2021]

Johns Hopkins University

Graduate Research Assistant

Department of Applied Mathematics & Statistics

Faculty Supervisor: Carey E. Priebe

[Jun 2019, Dec 2019]

Johns Hopkins University

Undergraduate Research Assistant

Department of Computer Science

Faculty Supervisor: Suchi Saria

[May 2017, May 2019]

DISSERTATIONS

1. **A. Alyakin**, *Robust Hypothesis Testing of Location Parameters using Lq-Likelihood-Ratio-Type Test in Python*, a thesis submitted to The Johns Hopkins University in conformity with the requirements for the degree of Master of Science in Engineering, 2019. [arXiv] [library] [code]
2. **A. Alyakin**, *Motif Discovery in the Irregularly Sampled Time Series Data*, a thesis submitted to The Johns Hopkins University in conformity with the requirements for Senior Honors Thesis in Computer Science, 2019. [pdf]

PUBLICATIONS

1. R. Guennoun[†], **A. Alyakin**[†], H. Higushi, S. Demehri, *Commensal HPVs Have Evolved to Be More Immunogenic Compared with High-Risk α -HPVs*, Vaccines, 2024. [journal]
2. J. Lee, M. A. Ruiz-Cardozo, R. P. Patel, S. Javeed, R. S. Lavandi, C. Newsom-Stewart, **A. Alyakin**, C. A. Molina, N. Agarwal, W. Z. Ray, M. Santacatterina, B. H. Pennicooke, *Clinical Prediction for Surgical versus Nonsurgical Interventions in Patients with Vertebral Osteomyelitis and Discitis*, Journal of Spine Surgery, 2024. [journal]
3. **A. A. Alyakin**, J. Agterberg, H. S. Helm, and C. E. Priebe, *Correcting a Nonparametric Two-sample Graph Hypothesis Test for Graphs with Different Numbers of Vertices with Applications to Connectomics*, Applied Network Science, 2024. [arXiv] [journal] [code]
4. M. Powell, C. Clark, **A. Alyakin**, J. T. Vogelstein, B. Hart, *Exploration of Residual Confounding in Analyses of Associations of Metformin Use and Outcomes in Adults With Type 2 Diabetes*, JAMA Network Open, 2022. [arXiv] [journal]
5. F. Rahman, N. Finkelstein, **A. Alyakin**, N. A. Gilotra, J. Trost, S. P. Schulman, S. Saria, *Using Machine Learning for Early Prediction of Cardiogenic Shock in Patients with Acute Heart Failure*, Journal of the Society for Cardiovascular Angiography & Interventions, 2022. [arXiv] [journal]
6. J. Chung[†], B. Varjavand[†], J. Arroyo, **A. Alyakin**, J. Agterberg, M. Tang, J. T. Vogelstein, C. E. Priebe, *Valid Two-Sample Graph Testing via Optimal Transport Procrustes and Multiscale Graph Correlation with Applications in Connectomics*, Stat, 2021. [arXiv] [journal] [code]
7. K. Marchisio, Y. Park, A. Saad-Eldin, **A. Alyakin**, K. Duh, C. Priebe, P. Koehn, *An Analysis of Euclidean vs. Graph-Based Framing for Bilingual Lexicon Induction from Word Embedding Spaces*, Findings of the Association for Computational Linguistics: EMNLP 2021. [arXiv] [journal] [code]

PREPRINTS

1. C. Hang, R. Deng, L. Y. Jiang, Z. Yang, D. A. Alber, **A. Alyakin**, E. K. Oermann, *BPQA Dataset: Evaluating How Well Language Models Leverage Blood Pressures to Answer Biomedical Questions*, submitted, 2024.
2. K. L. Sangwon, D. Kurland, **A. Alyakin**, D. Kondziolka, E. K. Oermann, *Seven Decades Of Change: Tracing The Evolution Of Neurosurgery Through Lexical Analysis Of Neurosurgery Publications Of The CNS (1955-2024)*, submitted, 2024.
3. K. L. Sangwon, **A. Alyakin**, D. Kurland, E. Leuthardt, D. Kondziolka, E. K. Oermann, *A Generalizable Pipeline for Building an Extensive Domain-Specific Dataset from a Medical Journal - Neurosurgery Edition*, submitted, 2024.
4. **A. Alyakin**, D. Kurland, D. A. Alber, K. L. Sangwon, D. Li, E. Leuthardt, D. Kondziolka, E. K. Oermann, *CNS-CLIP: Transforming a Neurosurgical Journal into a Multimodal Medical Model*, submitted, 2024.
5. **A. Alyakin**, Y. Qin, and C. E. Priebe, *LqRT: Robust Hypothesis Testing of Location Parameters using Lq-Likelihood-Ratio-Type Test in Python*, 2019. [arXiv] [code]

[†] signifies equal contribution. author order preserved as in manuscript.

SOFTWARE

microsoft/graspologic (previously **neurodata/graspy**)

Contributor to and one of the maintainers of **graspologic**, an open-source Python package that provides utilities and algorithms for doing statistical analyses on graph- and network-valued data. Notable contributions include latent distribution test implementation and the align module.

alyakin314/lqrt

Author and sole maintainer of **lqrt**, a Python package that implements the Robust Hypothesis Testing of Location Parameters using Lq-Likelihood-Ratio-Type Test.

Data-Driven Discovery of Models Library - JHU Graph Primitives

One of the primary maintainers of the repository that is JHU's contribution to the D3M's library of selectable primitives that are used as basic building blocks in the automated model discovery process. JHU's primitives are aimed at tackling machine learning problems with graph, or network, inputs, such as Vertex Classification, Community Detection, Link Prediction and Seeded Graph Matching.

AWARDS

Johns Hopkins University

Applied Mathematics & Statistics Prize for Outstanding Master's Research	2020
Applied Mathematics & Statistics Achievement Award	2019
Undergraduate General Honors	2019
Undergraduate Departmental Honors with Thesis, Computer Science	2019
Undergraduate Departmental Honors, Applied Mathematics & Statistics	2019
Whitening School of Engineering Dean's List (8/8 Semesters)	2015-2019

TEACHING

Johns Hopkins University

Teaching Assistant

580.475 Biomedical Data Science	Fall 2019
553.430/630 Introduction to Statistics	Spring 2019
553.436/636 Data Mining	Fall 2018

SKILLS

Languages (in order of proficiency):

Python, English, Russian, R, Matlab, Java, C++.

Python skills:

PyTorch, PyTorchLightning, LightningFabric, HuggingFace Accelerate, DeepSpeed, Tensorflow.

Other skills:

Prompt Engineering, L^AT_EX, Git, Databases (PostgreSQL, BigQuery), Bouldering (7a/V6 indoor; V2 outdoor), Lead climbing (6b/5.10).