ANTON ALYAKIN

alyakin314@gmail.com ⋄ alyakin314.github.io

EDUCATION

Washington University in St. Louis *[Aug 2021, May 2026]*
Doctor of Medicine *(Expected)*
One-Year Research without Degree Program (MD5)

Johns Hopkins University *[Jan 2019, Dec 2019]*
Master of Science in Engineering
Applied Mathematics & Statistics

Johns Hopkins University *[Aug 2015, May 2019]*
Bachelor of Science
Computer Science
Applied Mathematics & Statistics

RESEARCH

New York University *[Mar 2024, present]*
Visitng Medical Student Researcher
Department of Neurosurgery / OLAB
Faculty Supervisor: Eric K. Oermann

Washington University in Saint Louis *[Mar 2023, present]*
Medical Student Researcher
Department of Neurosurgery / Leuthardt Lab
Faculty Supervisor: Eric Leuthardt

Johns Hopkins University *[Jan 2020, Mar 2021]*
Assistant Research Engineer
Department of Applied Mathematics & Statistics / Neruodata Lab
Faculty Supervisors: Carey E. Priebe & Joshua T. Vogelstein

Johns Hopkins University *[Jun 2019, Dec 2019]*
Graduate Research Assistant
Department of Applied Mathematics & Statistics
Faculty Supervisor: Carey E. Priebe

Johns Hopkins University *[May 2017, May 2019]*
Undergraduate Research Assistant
Department of Computer Science
Faculty Supervisor: Suchi Saria

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 Irregulary 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]

ABSTRACTS

1. 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)*, Digital Abstract at the 2024 Annual CNS Meeting, to appear, 2024.
2. 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*, Oral Presentation at the 2024 Annual CNS Meeting, to appear, 2024.
3. **A. Alyakin**, D. Kurland, D. Alber, K. Sangwon, D. Li, A. Tsirigos, E. Leuthardt, D. Kondziolka, E. Oermann, *CNS-CLIP: Transforming a Neurosurgical Journal into a Multimodal Medical Model*, Oral Presentation at the 2024 Annual CNS Meeting, to appear, 2024.

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. **A. Alyakin**, D. Kurland, D. Alber, K. Sangwon, D. Li, A. Tsirigos, E. Leuthardt, D. Kondziolka, E. Oermann, *CNS-CLIP: Transforming a Neurosurgical Journal into a Multimodal Medical Model*, submitted, 2024.
3. **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 mainterners 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 netowrk, 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, LaTeX, Git, Databases (PostgreSQL, BigQuery), Bouldering (7a/V6 indoor; V2 outdoor), Lead climbing (6b/5.10).