

Gaidukasov Rafael

Junior Data Scientist / Junior ML-Engineer

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Summary

Data scientist / ML engineer / Scientist. Currently working on a thesis in the field of machine learning application in physics problems. I want to apply my knowledge to solve problems in production or research. I'm graduated the professional training course Data Science bootcamp from Yandex EdTech. The final project was the work on optimizing the production costs of the metallurgical combine of LLC "So we temper steel". It was necessary to build a model that would predict the temperature of the steel after processing. I also completed the course "Introduction to Machine Learning" from the HSE and the School of Data Analysis on the Coursera platform. At the end of the course, it was necessary to build a model to predict the winner of a Dota 2 match by the first 5 minutes of the game.

Education (Master's degree)

2021-2025	Moscow Institute of Physics and Technology (MIPT State University). Phystech School of Electronics, Photonics and Molecular Physics, Physics and Astronomy, PhD degree
2019-2021	Moscow Institute of Physics and Technology (MIPT State University). Phystech School of Electronics, Photonics and Molecular Physics, Applied Mathematics and Physics, Master's degree
2015-2019	Moscow Institute of Physics and Technology (MIPT State University). Department of Photonics and Molecular Physics, Applied Mathematics and Physics, Bachelor's degree

Relevant courses

11.2022-04.2023	Practicum by Yandex (INO CPE "Yandex EdTech") Data Science bootcamp Professional Training Course.
03.2022	Coursera, HSE University and Yandex School of Data analysis, Introduction to Machine Learnin

Skills

Data Scientist: Python, Pandas, Numpy, Scikit-Learn, CatBoost, TensorFlow, Keras, PostgreSQL, Statistics, Seaborn, Mathematical analysis

Languages: Russian (Native), English (B2)

Employment History

Valiev Institute of Physics and Technology of Russian Academy of Sciences. (<https://ftian.ru/en/>)

12.2022-Present

Laboratory of Functional Dielectrics for Microelectronics

Junior scientist.

Tools: Python, Git, Pandas, NumPy, TensorFlow, Keras, Scikit-Learn, SciPy, PyQt5

Responsibilities:

- Applications of ML for solving spectral ellipsometry problems
- Work on a thesis for the PhD degree in physical and mathematical sciences
- Spectral Ellipsometry Installation Operator

Achievements:

- Proposed using machine learning in the field of physics (to solve problems of spectral ellipsometry). This simplified the work with micro- and nanoelectronics materials and automated the process of their analysis. According to the developed method, an article is being prepared for publication.
- Modified the spectral reflectometry method for cryogenic plasma chemical etching installations. I wrote a special software for calculating the parameters of samples in situ, in which I applied the BFGS and ML method.

09.2022-12.2022

Laboratory of microstructuring and submicron devices.

Junior scientist.

Tools: Python, Git, Pandas, NumPy, SciPy, Arduino, MATLAB

Responsibilities:

- Developed methods and devices for *in situ* / *ex situ* diagnostics of materials for micro- and nanoelectronics
- Spoke at National and International conferences
- Performed projects on grants

Achievements:

- Applications of Tikhonov regularization for the problem of ellipsometric porometry. An article has been written based on the results obtained (doi: 10.1134/S1063739722040060)

02.2020-08.2021

Laboratory of microstructuring and submicron devices.

Engineer.

Tools: MATLAB, Arduino, C++

Responsibilities:

- Developed methods and devices for *in situ*/*ex situ* diagnostics of materials used in micro/nanoelectronics.

Achievements:

- Applied the laser interferometer method for cryogenic plasma chemical etching chambers, which made it easier to work with samples in plasma. He reported on the work done at three conferences.
- I assembled an installation for porometry and wrote software for it in the C++ programming language.

Conferences: Talks & Posters

1. Gaydukasov R., Miakonkikh A. Investigation of gas condensation in pores of nanoporous dielectrics in cryogenic etching conditions. The 15th International Conference “Micro- and Nanoelectronics – 2023” (ICMNE-2023), Zvenigorod, Moscow Region.

2. Gusev E., Avdeev S.P., Kislyak P., Sukhanov M., Gaydukasov R., Ren X., Chen D., Han L., Zhang W., Ageev O. Piezoelectric zinc oxide films and polysilicon on isolator structures for MOEMS. The 15th International Conference "Micro- and Nanoelectronics – 2023" (ICMNE-2023), Zvenigorod, Moscow Region.
3. Trushin O.S., Fattakhov I.S., Popov A.A., Mazaletsky L.A., Lomov A.A., Zakharov D.M., Gaydukasov R.A., Miakonkikh A.V., Shendrikova L.A. Controlled nanostructuring of magnetic films by oblique angle deposition. The 15th International Conference "Micro- and Nanoelectronics – 2023" (ICMNE-2023), Zvenigorod, Moscow Region.
4. Gaydukasov R., Miakonkikh A. Application of Machine Learning approach to spectral ellipsometry. The 15th International Conference "Micro- and Nanoelectronics – 2023" (ICMNE-2023), Zvenigorod, Moscow Region.
5. Трушин О.С., Фаттахов И.С., Попов А.А., Мазалецкий Л.А., Гайдукасов Р.А., Мяконьких А.В. Получение хиральной метаповерхности методом наклонного напыления. (ВИП-2023) XXVI Международная конференция «Взаимодействие ионов с поверхностью».
6. Гайдукасов Р.А., Мяконьких А.В. Исследование адсорбции газов в пористых low-k диэлектриках при помощи метода спектральной рефлектометрии. «Перспективные материалы и технологии» («ПМТ - 2023»). Международная конференция, 11 апреля 2023. Устный доклад, секционный. (<https://www.elibrary.ru/item.asp?id=54607850&pff=1>)
7. Гайдукасов Р.А., Мяконьких А.В. Исследование пористых low-k диэлектриков с помощью спектральной эллипсометрии. «Перспективные материалы и технологии» («ПМТ - 2022») Международная конференция, 11 апреля 2022. Устный доклад, секционный.
8. Гайдукасов Р.А. Исследование адсорбции в плёнках нанопористых low-k диэлектриков с помощью эллипсометрической порометрии. VII всероссийский молодежный научный форум; Наука будущего - Наука молодых, 23-26 августа 2022; Устный доклад, секционный.
9. Гайдукасов Р.А., Мяконьких А.В. Исследование адсорбции газов в пористых диэлектриках при помощи лазерного интерферометра при пониженных температурах. 62-ая всероссийская научная конференция МФТИ, 18-23 ноября 2019. Устный доклад, секционный.
10. Гайдукасов Р.А., Мяконьких А.В., Руденко К.В. Применение метода регуляризации Тихонова к решению задач эллипсометрической порометрии. 63-я всероссийская научная конференция МФТИ, 23-29 ноября 2020. Устный доклад, секционный.
11. Гайдукасов Р.А., Мяконьких А.В. Исследование нанопористых диэлектриков с помощью эллипсометрической порометрии. 64-ая всероссийская научная конференция МФТИ, 29 ноября – 03 декабря 2021. Устный доклад, секционный.
12. Gaydukasov R.A., Miakonkikh A.V. Investigation of nanoporous low-k dielectrics by spectral ellipsometry. The 14th International Conference Micro- and Nanoelectronics – 2021 (ICMNE-2021), 4-8 Oct 2021. Poster presentation.
13. Гайдукасов Р.А., Кlemente И.Э., Мяконьких А.В., Руденко К.В. Применение интерферометрии и эллипсометрии для прецизионных измерений толщин слоев в процессах плазменного осаждения и травления. 1-ая всероссийская конференция с международным участием «газоразрядная плазма и синтез наноструктур» (GDP-NANO 2020), 2-5 декабря 2020. Устный доклад.
14. Gaydukasov R.A., Miakonkikh A.V. Application of laser reflectometry for study of adsorption of gases on porous low-k dielectrics during cryo etching. International Conference on Modern Problems in the Physics of Surfaces and Nanostructures Yaroslavl, 26-29 Aug 2019. Poster presentation.

Journal Papers

1. Application of the Tikhonov Regularization Method in Problems of Ellipsometric Porometry of Low-K Dielectrics. Gaidukasov, R.A., Miakonkikh, A.V., Rudenko, K.V. // (2022) Russian Microelectronics, Vol. 51, № 4. P. 199-209. DOI: 10.1134/S1063739722040060 Received January 6, 2022;
2. Trushin O.S. et al. Tailoring magnetic anisotropy and optical characteristics of nanostructural Co films by oblique angle deposition // Physics of the Solid State. Ioffe Institute Russian Academy of Sciences, 2023. Vol. 65, № 6. P. 953. DOI: 10.21883/PSS.2023.06.56107.16H

3. А.В. Мяконьких, Р.А. Гайдукасов, В.О. Кузьменко. Исследование методов анизотропного плазмохимического травления low-k слоев с защитой пористой структуры материала. ВЕСТНИК РФФИ: СОВРЕМЕННЫЕ ПРОБЛЕМЫ ФОТОНИКИ ИНФРАКРАСНОГО ДИАПАЗОНА. DOI: 10.22204/2410-4639-2023-117-01-122-136