ALEXEY GORELOV

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PERSONAL STATEMENT

In high school, I was in a class specialized in mathematics. At that time I often participated in school-level olympiads in informatics and was a medallist at some of them. This gave me some programming experience and the ability to think algorithmically and combinatorially (competitive programming is mainly about algorithms, especially algorithms on graphs).

In 2015 I got a specialist's degree in Applied Mathematics and Informatics at Lomonosov Moscow State University. There I studied data analysis and machine learning. My thesis work focused on developing a probabilistic model for message passing delays between nodes of a computing cluster.

After the graduation, I decided to gain practical experience in the field of data analysis, so I got a job at Mail.Ru Group (the second largest IT company in Russia). There I worked on revenue predictions, planning and analysis of experiments, and so on. Also, I gained strong programming experience there (Python, Java, Hadoop).

But after several years I began to feel that my work has turned into a routine and that I really missed the beauty of mathematics. In 2019 I entered a master's program in Mathematics at Higher School of Economics (HSE), and I got a master's degree in 2021. My 1st year course work at HSE was on the characterization of collapsible polyhedra in terms of free deformation contractibility, while my thesis work was about the problem of an existence of a lifting to an embedding of a map between graphs. In 2021, after the graduation from HSE, I started my PhD program at Steklov Mathematical Institute of RAS.

I guess my main strength is an ability to combine the combinatorial and topological ways of thinking. I like both geometrical beauty and combinatorial technics, so the fields of my interest are piecewise linear topology and topological graph theory. I am also interested in logic, especially proof theory.

EDUCATION

Ph.D. in Mathematics (incomplete) October 2021 — September 2022

Steklov Mathematical Institute of Russian Academy of Sciences

Supervisor: Sergey Melikhov

M.Sc. in Mathematics (with excellence) September 2019 — June 2021

Faculty of Mathematics,
National Research University Higher School of Economics

Supervisor: Sergey Melikhov
Thesis title: Lifting maps between graphs to embeddings
GPA: 9.33 out of 10

Specialist's degree in Applied Mathematics and Informatics September 2010 — June 2015

Faculty of Computational Mathematics and Cybernetics,
Lomonosov Moscow State University

Supervisor: Archil Maysuradze
Thesis title: Анализ задержек в коммуникационной среде вычислительного кластера [Latency analysis of computing cluster network]
GPA: 4.71 out of 5

ADDITIONAL EDUCATION

Autumn school "Toric topology and combinatorics" 1—5 November 2021

Sirius Mathematics Center, Sochi, Russia

PUBLICATIONS

Geometry of collapsing and free deformation retraction 2021
Alexey Gorelov
arXiv:2103.16464 [math.GT]

Информационная модель для снятия многозначности морфемного разбора в татарском языке [Information model for morphological disambiguation in the Tatar language] 2018
Горелов А.А., Майсурадзе А.И. [Gorelov A., Maysuradze A.]
Дискретные модели в теории управляющих систем: X Международная конференция, Москва и Подмосковье, 23-25 мая 2018 : Труды, том 1, с. 104-106

Анализ структуры задержек передачи информации в вычислительном кластере [Delay structure mining in a computing cluster] 2015
А.А. Горелов, А.И. Майсурадзе, А.Н. Сальников [Gorelov A., Maysuradze A., Salnikov A.]
Proceedings of the 1st Russian Conference on Supercomputing - Supercomputing Days 2015

CONFERENCE PRESENTATIONS

Reconstructing knots from point clouds with persistent homology 2022

Maxim Beketov, Alexey Gorelov, German Magai
Poster presentation
The interdisciplinary world of tangling, Potsdam, Germany

Geometry of collapsing and free deformation retraction 2021
Alexey Gorelov
Poster presentation
Young Topologists Meeting 2021, Stockholm, Sweden (online)

Geometry of collapsing and free deformation retraction 2021
Alexey Gorelov
Poster presentation
Graduate Student Topology and Geometry Conference 2021, Indiana University, USA (online)

Анализ структуры задержек передачи информации в вычислительном кластере [Delay structure mining in a computing cluster] 2015
А.А. Горелов, А.И. Майсурадзе, А.Н. Сальников [Gorelov A., Maysuradze A., Salnikov A.]
Poster presentation
Russian Supercomputing Days 2015, Moscow, Russia

Восстановление зерновых вершин графа, полученного поиском в ширину [Reconstructing the seed vertices of a graph obtained by the breadth-first search algorithm] 2013
Alexey Gorelov
Oral presentation
International student, postgraduate and young scientist conference "Lomonosov-2013", Moscow, Russia

TEACHING EXPERIENCE

Visiting scholar January 2021 — April 2021
Conducting seminars for the course "Linear Algebra" for 1st year undergraduate students,
Graduate School of Business,
National Research University Higher School of Economics

Teaching assistant January 2020 — May 2020

Course "Mathematical analysis" for 1st year undergraduate students,
Faculty of Mathematics,
National Research University Higher School of Economics

Visiting scholar September 2019 — December 2019

Conducting seminars for the course "Algebra and Geometry" for 1st year undergraduate students,
Graduate School of Business,
National Research University Higher School of Economics

SCHOLARSHIPS AND GRANTS

Special scholarship for HSE master's students 2020 — 2021

Russian Foundation for Basic Research grant №15–07–09214 2017
(one of the participants)

SEMINAR REPORTS

Поднятие погружений до вложений в коразмерности один [Lifting immersions to embeddings in codimension one] 23 February 2022

Geometric Topology Seminar, Steklov Mathematical Institute of RAS, Moscow, Russia

Slides and recordings (in Russian).

Поднятие отображений между графами во вложение [Lifting maps between graphs to embeddings] 28 May 2021

Geometric Topology Seminar, Steklov Mathematical Institute of RAS, Moscow, Russia

Recordings (in Russian).

Аппроксимация вложениями отображений графов в плоскость [Approximation by embeddings of maps of graphs into the plane] 28 April, 2 May 2021

Geometric Topology Seminar, Steklov Mathematical Institute of RAS, Moscow, Russia

Recordings (in Russian) of the first part and the second part.

Некоторые характеризации CAT(0) кубических комплексов [Some characterizations of CAT(0) cubical complexes] 11, 18 December 2020

Geometric Topology Seminar, Steklov Mathematical Institute of RAS, Moscow, Russia

Slides and recordings (in Russian) of the first part and the second part.

The Kister-Mazur theorem 8 December 2020

Seminar on smooth, PL- and topological manifolds, Faculty of Mathematics, Moscow, Russia

Slides.

Сдавливание и свободная деформационная ретракция [Collapsing and free deformation retraction] 5 June 2020

Seminar of International Laboratory of Algebraic Topology and Its Applications, Faculty of Computer Sciences of HSE, Moscow, Russia

Сдавливание и свободная деформационная ретракция [Collapsing and free deformation retraction] 13 May 2020

Geometric Topology Seminar, Steklov Mathematical Institute of RAS, Moscow, Russia

Slides and recordings (in Russian).

Медианные пространства и выпуклые структуры [Median spaces and convex structures] 11 December 2019

Geometric Topology Seminar, Steklov Mathematical Institute of RAS, Moscow, Russia

Slides and recordings (in Russian).

STUDENT OLYMPIADS PARTICIPATION

HSE Olympiad competition for students and graduates, track "Mathematics" 2019

II degree diploma

WORK EXPERIENCE

Steklov Mathematical Institute of Russian Academy of Sciences October 2021 — September 2022

Research assistant at the Department of Geometry and Topology

Mail.ru Group September 2015 — October 2019

Data analyst and data scientist in Mail.ru Search

OTHER EDUCATION

Creative Writing School October 2015 — December 2015

Poetry workshop, supervised by Dmitry Bykov

PROFESSIONAL SKILLS

Programming languages

Working knowledge: Python, Java, bash, C, Emacs Lisp
Basic knowledge: C++, Matlab, R, Go, Kotlin, C#

Software and technologies

GNU/Linux (I've been working with GNU/Linux since 2008), Python scientific stack (numpy, scipy, sympy, matplotlib), Hadoop, Matlab, VCS

Languages

Russian: native speaker
English: upper intermediate
French: elementary