

CONTACT INFORMATION	University of Calgary 2500 University Drive NW Calgary, AB, Canada T2N 1N4 Tel: (970) 591-2363	Homepage: https://contacts.ucalgary.ca/info/math/profile/12194586 Github: https://github.com/kgolubnichiy ✉ E-mail: kirill.golubnichil@ucalgary.ca
RESEARCH BACKGROUND	<ul style="list-style-type: none"> • Partial Differential Equations • Inverse Problems • Ill-posed Problems • Computational Inverse and Ill-posed Problems • Optimization • Numerical Analysis • Machine Learning/Deep Learning • Neural Network • Mathematical Finance 	
EDUCATION	<p>University of Washington, Seattle, WA, USA 2016–2022</p> <ul style="list-style-type: none"> • Ph.D. in Department of Mathematics, GPA: 4/4. • Advisor: Prof. Kenneth Bube. • Co adviser: Prof. Michael Klibanov <p>University of Washington (UW), Seattle, WA, USA. 2016–2019</p> <ul style="list-style-type: none"> • MS., Mathematics. GPA: 3.89/4 <p>University of North Carolina (UNCC), Charlotte, NC, USA. 2013–2015</p> <ul style="list-style-type: none"> • MS., Mathematics. • Thesis: <i>The Practical Inverse Problems for Black–Scholes equation.</i> <p>Peoples' Friendship University of Russia (PFUR), Moscow, Russia. 2005–2007</p> <ul style="list-style-type: none"> • MS., Mathematics. • Thesis: <i>Controllability problems for modified transport equation.</i> <p>Peoples' Friendship University of Russia (PFUR), Moscow, Russia. 2000–2005</p> <ul style="list-style-type: none"> • B.Sc., Mathematics. • Thesis: <i>Controllability problems for modified transport equation.</i> 	
TECHNICAL SKILLS	<ul style="list-style-type: none"> • <i>Programming Languages</i>: Python, SciPy, Pytorch, Latex. • <i>Technical Softwares</i>: MATLAB, Bloomberg Terminal. 	
EMPLOYMENT	<ul style="list-style-type: none"> • Postdoctoral fellow 8/2022–present University of Calgary, Calgary and Fin-Ml. • Teaching Assistant 3/2016–7/2022 University of Washington, Seattle. • Teaching Assistant 8/2014–2015 University of North Carolina, Charlotte. 	

- **Research Assistant (grant W911NF-11-1-0399 sponsored by US Army Research Laboratory and US Army Research Office)** 8/2013–8/2014
University of North Carolina, Charlotte.
 - **Teaching Assistant** 9/2006-2/2009
Peoples' Friendship University of Russia, Moscow.
 - **Lecturer** 9/2006-2/2009
Moscow state university of economics, statistics and computer science, Moscow, Russia.
- INDUSTRY
- **Researcher (Stability of flights)** 2008–2009
Ilyushin Aviation Complex (OJSC), Moscow, Russia.
Implementations for the project below were done in C/C++.
- SYMPOSIUM
- **Talk, Quasilinear Equations, Inverse Problems and Their Applications**, MIPT
Moscow, Russia, December 4-6, online, 2023.
 - **Talk, The Canadian Mathematical Society (CMS), Winter Meeting**
Montréal, Quebec, Canada, December 1-4, 2023.
 - **Talk, Fin-ML 5th Anniversary**, HEC Montréal, Quebec, Canada, November 7-8, 2023.
 - **Talk, Colloquium**, Department of Mathematics and Statistics, UNCC, Charlotte, NC, USA,
October 6th, 2023.
 - **Talk, BIRS workshop on "Nonlinear Inverse Problems"**, Banff International Research
Station, Alberta, Canada, July 16-21, 2023.
 - **Talk, The Canadian Mathematical Society (CMS), Summer Meeting**
University of Ottawa, Ottawa, Ontario, Canada, June 2-5, 2023.
 - **Talk, Annual Alberta Mathematics Dialogue (AMD) 2023**, Pacific Institute for The
Mathematical Sciences, Calgary, Alberta, Canada, May 4-5, 2023.
 - **Talk, Colloquium**, Department of Mathematics and Statistics, University of Calgary, Calgary,
Alberta, Canada, December 6th, 2022.
 - **Talk, Mathematical Physics, Dynamical Systems and Infinite-Dimensional Analysis–2021**
Moscow Institute of Physics and Technology, Moscow Region, Dolgoprudny, Russia, June 30–July
9, 2021, online, 2021.
 - **Talk, MATH+X SYMPOSIUM ON INVERSE PROBLEMS AND DEEP LEARNING IN SPACE EXPLORATION**
Rice University, Houston, TX, USA, January 23-25, 2019.
 - **Talk, MATH+X SYMPOSIUM ON DATA SCIENCE AND INVERSE PROBLEMS IN GEOPHYSICS**
Rice University, Houston, TX, USA, January 24-26, 2018.

WORKSHOP

- **The 13th Montreal Industrial Problem Solving Workshop organized by the CRM and IVADO**, Montreal, Canada, August 21-25, 2023.
- **BIRS workshop on "Nonlinear Inverse Problems"**, Banff International Research Station, Alberta, Canada, July 16-21, 2023.
- **The Canadian Mathematical Society (CMS), Summer Meeting**
University of Ottawa, Ottawa, Ontario, Canada, June 2-5, 2023.
- **Math Industry, Pacific Institute for the Mathematical Sciences**
University of British Columbia, University of Calgary, University of Alberta, August, 2020 (remote).
- **MATH+X SYMPOSIUM ON DATA SCIENCE AND INVERSE PROBLEMS IN GEOPHYSICS**
Rice University, Houston, TX, USA, January 22-24, 2018.

REVIEWER

- **The Numerical Algorithms Journal** 2022–present
Springer Science+Business Media, LLC, part of Springer Nature.

MENTORING
EXPERIENCE

- **Spring 2022** 2022
Reading Course. Computational Ill-posed Problems for predicting option prices. (James Zheng Cao, Duncan Du, Matthieu Durieux, Yuqing (Queenie) Liu, University of Washington).
- **Spring 2022** 2022
Graduate Mentor for the undergraduate reading project Mathematics for Math Finance, Machine Learning, & Computational Ill-posed Problems for predicting option prices. (Benjamin Jiang and Wanchaloem Wenkaew, University of Washington) Washington Directed Reading Program.
- **May 2022** 2022
2022 Undergraduate Research Symposium. The project title is Math Finance, Machine Learning, & Computational Ill-posed Problems for predicting option prices. (James Zheng Cao, UW) Washington Directed Reading Program.
- **Winter 2022** 2022
Graduate Mentor for the undergraduate reading project Mathematics for Math Finance, Machine Learning, & Computational Ill-posed Problems for predicting option prices. (James Zheng Cao and Lisa Lyu, University of Washington) Washington Directed Reading Program.
- **Autumn 2021** 2021
Graduate Mentor for the undergraduate reading project Mathematics for Application of Neural network for real market. (Mohit Bansal, University of Washington) Washington Directed Reading Program.
- **Spring 2021** 2021
Graduate Mentor for the undergraduate reading project Mathematics for Stock Options Trading stocks. (Michelle Tiffany Tan, University of Washington) Washington Directed Reading Program.
- **Winter 2021** 2021
Graduate Mentor for the undergraduate reading project Stocks, PDE's, and Linear Algebra: Ill-Posed Problems and the Tikhonov Functional (Zhiyang Li and Jason Miller, University of Washington) Washington Directed Reading Program.

- **Spring 2020** 2020
Graduate Mentor for the undergraduate reading project Ill-posed Problems, Parabolic PDEs (Andrew Bereza, University of Washington) Washington Directed Reading Program.
- **Autumn 2019** 2019
Graduate Mentor for the undergraduate reading project A Numerical Solver on Ill- posed Problems and Applications on Machine Learning. (Tianyang Wang, University of Washington, University of Michigan (now)) Washington Directed Reading Program.

BOOKS

1. **Kirill V. Golubnichiy** *Higher mathematics for Colleges*. The manual, the book of problems. Moscow state university of economics, statistics and computer science (MESI) Moscow, Russia 2007 (in Russian).
2. **Kirill V. Golubnichiy, Andrey O. Shishanin and Edwin R. Benavente** *Higher mathematics*. (Second edition, revised and enlarged). The manual, the book of problems, Second edition, revised and enlarged, For students of higher technical schools, Peoples' Friendship University of Russia (PFUR), Moscow, 2009, (in Russian)
3. **Kirill V. Golubnichiy, Andrey O. Shishanin and Edwin R. Benavente** *Higher mathematics*. (Third edition, revised and enlarged). The manual, the book of problems, Second edition, revised and enlarged, For students of higher technical schools, Peoples' Friendship University of Russia (PFUR), Moscow, 2010, (in Russian)
4. **Galina V. Shadrina and Kirill V. Golubnichiy** *Economic Analysis: Textbook for Universities*. (Edition: 4th revised and expanded edition). Yurait Publishing, Higher Education, ISBN: 978-5-534-16899-0, URL: <https://urait.ru/bcode/531991>, Accessed Date: 28.06.2023.
5. **Galina V. Shadrina and Kirill V. Golubnichiy** *Financial and Economic Activity Analysis: Textbook for Universities*. (Edition: 4th revised and expanded edition). Yurait Publishing, Higher Education, ISBN: 978-5-534-16899-0, URL: <https://urait.ru/bcode/531991>, Accessed Date: 28.06.2023.
6. **Galina V. Shadrina and Kirill V. Golubnichiy** *Managerial and Financial Analysis: Textbook for Universities*. (Edition: 2th revised and expanded edition). Yurait Publishing, Higher Education, ISBN: 978-5-534-16899-0, URL: <https://urait.ru/bcode/531991>, Accessed Date: 28.06.2023.
7. **Galina V. Shadrina and Kirill V. Golubnichiy** *Theory of Economic Analysis: Textbook for Universities*. (Edition: 2th revised and expanded edition). Yurait Publishing, Higher Education, ISBN: 978-5-534-16899-0, URL: <https://urait.ru/bcode/531991>, Accessed Date: 28.06.2023

PUBLICATIONS

1. **Mikhail V. Klibanov, Aleksander A. Shananin, Kirill V. Golubnichiy and Sergey Kravchenko**. *Forecasting of Stock Option Prices via the Solution of an Ill-Posed Problem*. arXiv:2202.07174, Inverse Problems, 38 (11), 2022.
2. **Michael V. Klibanov, Andrey V. Kuzhuget and Kirill V. Golubnichiy** *An ill-posed problem for the Black-Scholes equation for a profitable forecast of prices of stock options on real market data*. Inverse Problems, 32 (1), 2016.
3. **Mikhail V. Klibanov, Kirill V. Golubnichiy and Andrey V. Nikitin** *Quasi-Reversibility Method and Neural Network Machine Learning for Forecasting of Stock Option Prices*. arXiv: 2111.06642, AMS Contemporary Mathematics, Volume 784, 2023
4. **Zheng Cao, Wenyu Du, Kirill V Golubnichiy** *Application of Convolutional Neural Networks with Quasi-Reversibility Method Results for Option Forecasting*. SAI 2023, Volume 2, LNNS 739, to appear, 2023, arXiv preprint arXiv:2208.14385, 2022
5. **Mikhail V. Klibanov, Kirill V. Golubnichiy and Kenneth Bube** *Globally Strictly Convex Tikhonov - like Functional for a coefficient Inverse Problem for 1-d Hyperbolic Equation*. In a progress.
6. **Benjamin Jiang, Matthieu Durieux and Kirill V Golubnichiy** *Solving the Stock Option Forecast problem by a numerical method for the Black-Scholes Equation with Machine Learning Classification Model*, arXiv preprint arXiv:2209.03512, SIAM Undergraduate Research Online, submitted, 2022.

7. **Wanchaloem Wunkaew, Yuqing Liu and Kirill V Golubnichiy** *Using the Newton-Raphson Method with Automatic Differentiation to Numerically Solve Implied Volatility of Stock Option through Binomial Model*. arXiv preprint arXiv:2207.09033, 2022, SIAM Undergraduate Research Online, submitted, 2022.
8. **Zheng Cao, Raymond Guo, Wenyu Du, Jiayi Gao, Kirill V Golubnichiy** *Optimizing Stock Option Forecasting with the Assembly of Machine Learning Models and Improved Trading Strategies*. Future of Information and Communication Conference (FICC) 2024, to appear, arXiv preprint arXiv:2211.15912, 2022
9. **Kirill V. Golubnichiy, Tianyang Wang and Andrey V. Nikitin** *An Evaluation of novel method of Ill-Posed Problem for the Black-Scholes solution*. Preprint, Arxiv, November 18, 2020.
10. **Kirill V. Golubnichiy** *Inverse problems for the nonlinear modified transfer equation*. Preprint, Arxiv, December 6, 2019.
11. **Kirill V. Golubnichiy** *On one the controllability problems for modified transfer equation*. Proceedings of the Voronez Winter School of Mathematics under S.G. Crain, VSU, Voronez, 2008, p 87-95. (in Russian)
12. **Kirill V. Golubnichiy** *The inverse problem for the nonlinear modified transfer equation*. Mathematical Notes. (in press, in Russian)
13. **Kirill V. Golubnichiy** *Inverse problems for the nonlinear modified transfer equation with final overriding*. Differential Equations. (in press, in Russian)
14. **Kirill V. Golubnichiy, Galina V. Shadrina** *Basic methods for forecast development of managing subject*. Scientific Bulletin of the Volgograd branch RANHiGS. Series: Economy, 2015.

CONFERENCE
PAPERS

1. **Kirill V. Golubnichiy** *Klibanov's Method of Ill-Posed Problem for the Black-Scholes Equation Solution and Machine Learning*. Moscow Institute of Physics and Technology, The Conference devoted to the 75-th anniversary of the Moscow Institute of Physics and Technology, Moscow Region, Dolgoprudny. Russia, June 30–July 9, 2021, online, 2021, Abstract, p. 55
2. **Kirill V. Golubnichiy** *About one theorem for non-linear transport equation*. 2015 SIAM Front Range Student Conference.
3. **Kirill V. Golubnichiy and Galina V. Shadrina** *About one theorem for non-linear transport equation*. Anniversary Meeting of the MAA Rocky Mountain Section in Colorado Springs, 2014.
4. **Kirill V. Golubnichiy** *About one Theorem for nonlinear transport equation*. International Conference on Differential and Difference Equations and Applications 2010 (CDDEA 2012), Strechno, Slovak Republic, June, 2012. (in English)
5. **Kirill V. Golubnichiy** *About two Theorems for nonlinear transfer equation*. International Conference on Differential and Difference Equations and Applications 2010 (CDDEA 2010), Strechno, Slovak Republic, June 21, 2010 - June 25, 2010. (in English)
6. **Kirill V. Golubnichiy** *About the theorem for the nonlinear transfer equation*. Voronez Winter School of Mathematics under S.G. Crain, Voronez, January 2010, Book of Abstracts, VSU 2010, p 165-166. (in English)
7. **Kirill V. Golubnichiy** *About a theorem for the modified nonlinear transfer equation*. Abstracts of the XLV Russian conference on mathematics, information science, physics, and chemistry problems (Moscow, Peoples' Friendship University of Russia, 2009), Book of Abstracts, Moscow, PFUR 2009, p 24-25. (in Russian)
8. **Kirill V. Golubnichiy** *On one the The controllability problems for modified transfer equation*. International Conference on Differential and Difference Equations and Applications 2008 (CDDEA 2008), Strechno, Slovak Republic, June 23, 2008 -June 27, 2008, p 24 (in English)
9. **Kirill V. Golubnichiy** *The controllability problems for modified transfer equation*. Differential Equations and Topology Dedicated to the Centennial Anniversary of Lev Semenovich Pontrygin (1908-1988), Abstracts, Moscow, June 17-22, 2008, MSU p 118. (in Russian)

10. **Kirill V. Golubnichiy** *The controllability problems for modified transfer equation*. Abstracts of the XLIV Russian conference on mathematics, information science, physics, and chemistry problems (Moscow, Peoples' Friendship University of Russia, 2008), Book of Abstracts, Moscow, PFUR 2008, p 4. (in Russian)
11. **Kirill V. Golubnichiy** *The controllability problems for modified transfer equation*. Voronez Winter School of Mathematics under S.G. Crain, Voronez, January 2008, Book of Abstracts, VSU 2008, p 41. (in Russian)
12. **Kirill V. Golubnichiy** *The controllability problems for modified transfer equation*. MIPT, Abstracts of the 3d International Conference dedicated to the 85 th anniversary of the corresponding member of the Russian Academy of Sciences, Prof. L.D. Kudriavzev, "Functional Spaces. Differential Operators and their Applications, General topology". MIPT, PFUR, Moscow 2008, p 247. (in Russian)
13. **Kirill V. Golubnichiy** *The controllability problems for modified transfer equation*. International conference "Differential Equation and Related Topics", dedicated to the memory of I.G. Petrovskii XXII joint session of Moscow Mathematical Society and I.G. Petrovskii Seminar, Moscow, May 21-26, 2007, Book of Abstracts, Moscow, MSU 2007, p 106. (in Russian)
14. **Kirill V. Golubnichiy** *The controllability problems for modified transfer equation*. Abstracts of the XLII Russian conference on mathematics, information science, physics, and chemistry problems (Moscow, Peoples' Friendship University of Russia, 2007), Book of Abstracts, Moscow, PFUR 2007, p11. (in Russian)

TEACHING
EXPERIENCE

- **Winter 2024** 2024
MATH 249: Introductory Calculus, University of Calgary, Calgary, Canada.
- **Fall 2023** 2023
MATH 375: Differential Equations for Engineers and Scientists, University of Calgary, Calgary, Canada.
- **Spring 2023** 2023
MATH 265: University Calculus I, University of Calgary, Calgary, Canada.
- **Winter 2023** 2023
MATH 277: Multivariable Calculus for Engineers and Scientists, University of Calgary, Calgary, Canada.
- **Fall 2022** 2022
MATH 375: Differential Equations for Engineers and Scientists, University of Calgary, Calgary, Canada.
- **Spring 2022** 2022
MATH 207 A: Introduction to Differential Equations, University of Washington, Seattle, USA.
- **Winter 2022** 2022
MATH 207 BA: Introduction to Differential Equations, University of Washington, Seattle, USA.
MATH 207 BB: Introduction to Differential Equations, University of Washington, Seattle, USA.
MATH 207 BC: Introduction to Differential Equations, University of Washington, Seattle, USA.
- **Autumn 2021** 2021
MATH 207 K: Introduction to Differential Equations, University of Washington, Seattle, USA.
- **Summer 2021** 2021
MATH 307 B: Introduction to Differential Equations, University of Washington, Seattle, USA.

- **Spring 2021** 2021
MATH 307 D: Introduction to Differential Equations, University of Washington, Seattle, USA.
- **Winter 2021** 2021
MATH 126 CA: Calculus with Analytic Geometry III, University of Washington, Seattle, USA.
MATH 126 CB: Calculus with Analytic Geometry III, University of Washington, Seattle, USA.
- **Autumn 2020** 2020
MATH 307 H: Introduction to Differential Equations, University of Washington, Seattle, USA.
- **Summer 2020** 2020
MATH 307 E: Introduction to Differential Equations, University of Washington, Seattle, USA.
- **Spring 2020** 2020
MATH 307 A: Introduction to Differential Equations, University of Washington, Seattle, USA.
- **Winter 2020** 2020
MATH 307 I: Introduction to Differential Equations, University of Washington, Seattle, USA.
- **Autumn 2019** 2019
MATH 307 J: Introduction to Differential Equations, University of Washington, Seattle, USA.
- **Summer 2019** 2019
MATH 307 A: Introduction to Differential Equations, University of Washington, Seattle, USA.
- **Spring 2019** 2019
MATH 307 A: Introduction to Differential Equations, University of Washington, Seattle, USA.
- **Winter 2019** 2019
MATH 126 AC: Calculus with Analytic Geometry III, University of Washington, Seattle, USA.
MATH 126 AD: Calculus with Analytic Geometry III, University of Washington, Seattle, USA.
- **Autumn 2018** 2018
MATH 126 FA: Calculus with Analytic Geometry III, University of Washington, Seattle, USA.
MATH 126 FB: Calculus with Analytic Geometry III, University of Washington, Seattle, USA.
- **Summer 2018** 2018
MATH 124 C: Calculus with Analytic Geometry I, University of Washington, Seattle, USA.
- **Spring 2018** 2018
MATH 126 EC: Calculus with Analytic Geometry III, University of Washington, Seattle, USA.
MATH 126 ED: Calculus with Analytic Geometry III, University of Washington, Seattle, USA.
- **Winter 2018** 2018
MATH 126 DC: Calculus with Analytic Geometry III, University of Washington, Seattle, USA.
MATH 126 DD: Calculus with Analytic Geometry III, University of Washington, Seattle, USA.
- **Autumn 2017** 2017
MATH 126 DC: Calculus with Analytic Geometry III, University of Washington, Seattle, USA.
MATH 126 DD: Calculus with Analytic Geometry III, University of Washington, Seattle, USA.
- **Spring 2017** 2017
MATH 125 CA: Calculus with Analytic Geometry II, University of Washington, Seattle, USA.
MATH 125 CB: Calculus with Analytic Geometry II, University of Washington, Seattle, USA.

- **Winter 2017** 2017
 MATH 124 BA: Calculus with Analytic Geometry I, University of Washington, Seattle, USA.
 MATH 124 BB: Calculus with Analytic Geometry I, University of Washington, Seattle, USA.
- **Fall Semester, 2014** 2014
 MATH 2241 Calculus III, University of North Carolina, Charlotte, USA. (grader)
 MATH : Calculus, University of North Carolina, Charlotte, USA (grader).
- **Spring Semester, 2015** 2015
 Matrices and Linear Algebra - 11826 - MATH 2164 – 007, Charlotte, USA. (grader)
 MATH : Calculus, University of North Carolina, University of North Carolina, Charlotte, USA
 (grader).

REFERENCES

- Dr. **Michael V. Klibanov**
 Institution University of North Carolina (UNCC)
 E-mail: mklibanv@uncc.edu
- Dr. **Kenneth Bube**
 Institution University of Washington (UW)
 E-mail: bube@uw.edu
- Dr. **Aleksandr Shananin**
 Institution Moscow Institute of Physics and Technology (MIPT)
 E-mail: alexshan@yandex.ru
- Dr. **Vsevolod Sakbaev**
 Institution Moscow Institute of Physics and Technology (MIPT)
 E-mail: fumi2003@mail.ru