Filip Belik

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Education

University of Utah, Salt Lake City, UT August 2022 – Current

- PhD Student in Applied Mathematics
- Intended Graduation in May 2027
- GPA: 4.000

Gustavus Adolphus College, St. Peter, MN September 2018 – May 2022

- BA Honors Mathematics and Computer Science
- Major GPA: 4.000; Cumulative GPA: 3.989
- Dean's Scholarship Recipient
- Student Host for Nobel Conference 2021, Big Data
- Department Assistant 2021
- Co-President of Gustavus Coding Club and Gustavus Club Tennis
- Mathematics, Computer Science, and Statistics Club; Running Club

Coursework (In progress *)

University of Utah

- MATH 6410 Ordinary Differential Equations
- MATH 6610 Analysis of Numerical Methods I
- MATH 6620 Analysis of Numerical Methods II
- MATH 6630 Numerical Method for Partial Differential Equations
- MATH 6710 Applied Linear Operators and Spectral Methods
- MATH 6720 Applied Complex Variables and Asymptotic Methods
- MATH 6740 Bifurcation Theory

Gustavus Adolphus College and High School

- AP Calculus A/B and B/C
- AP Statistics
- AP Physics A
- MCS-150 Discrete Mathematics
- MCS-177 Computer Science I (Python)
- MCS-178 Computer Science II (Java/Kotlin/Assembly)
- MCS-220 Introduction to Analysis
- MCS-221 Linear Algebra
- MCS-222 Multivariable Calculus
- MCS-256 Discrete Calculus
- MCS-265 Theory of Computation
- MCS-270 Android Development
- MCS-284 Computer Organization (C)
- MCS-313/314 Modern Algebra I and II
- MCS-321 Theory of Complex Variables
- MCS-331 Real Analysis
- MCS-353 Continuous Dynamical Systems
- MCS-355 Scientific Computing
- MCS-357 Discrete Dynamical Systems
- MCS-375 Algorithms
- MCS-377 Networking

Research

Conductivity of Blood with Dr. Hohenegger, Dr. Osting June 2022 - Present

- Modeling conductivity of flowing blood through elastic tube
- Working analytically with Navier Stokes in cylindrical coordinates
- Comparison of model results to measured data
- Use of global sensitivity analysis for model parameters

Undergraduate Honors Research Project with Dr. Bělík June 2021 – May 2022

- Senior year research project with Dr. Pavel Bělík for honor's major

- Modeled vortices as self-avoiding polygons (SAPs)
- Monte-Carlo methods to find average and optimal energy configurations across statistical temperatures
- Developed code in Julia to work with and visualize SAPs
- Wrote paper and presented to MCS Department and Faculty

Port-and-Sweep Solitaire with Dr. Siehler June 2020 – August 2020

- Six-week research project under Stephen Hilding Fund with Dr. Jacob Siehler
- Research of algebra associated with Port-and-Sweep Solitaire
- Use of different techniques to tackle one-dimensional army problem
- Presentation of information to other Gustavus student researchers

First-Year Research Experience with Dr. Yu May 2019 – November 2019

- Ten week research project under First-Year Research Experience (FYRE) fund with Dr. Louis Yu
- Accepted as one of six first-year Gustavus students for FYRE
- Use of different machine learning models in classification of tweets
- Construction of listener to run over twelve-week period for data collection
- Presented and attended research presentations at Midstates Consortium at University of Chicago

Honors

- Summer 2021 Fulbright Canada Mitacs Globalink Research Internship Awardee
  - Due to COVID, program moved online and elected to instead undergo Allianz internship
- Gustavus Nobel Conference 2021 Student Host
- Gustavus Math Computer Science and Statistics Department Assistant Fall 2021
- Summer 2020 Hilding Research Fund for project under Dr. Siehler
- Gustavus First-Year Research Program Recipient for project under Dr. Yu
  - Presented at 2019 Midstates Consortium at University of Chicago
- Winner of 2018 and 2019 Gustavus Math Problem Solving of the Month competitions
- Fall 2018 Gustavus Dean's Scholarship Recipient

Work Experience

University of Utah Mathematics Department August 2022 – Current

- Funded for Blood Modeling project, Fall 2022
- Lab TA for MATH 4600 Mathematics in Medicine, Spring 2023

Gustavus Mathematics and Computer Science Department February 2019 – May 2022

- Computer Science I Teacher's Assistant, Grader, and Tutor (Python)
- Computer Science II Teacher's Assistant and Tutoring (Kotlin and Java)
- Discrete Mathematics Grader
- Online volunteer tutoring during spring 2020 COVID semester

Allianz Life Hedging Intern, Golden Valley, MN May 2021 – August 2021

- Learned about quantitative finance; specifically in hedging
- Software development through programming in C# and SQL
- Developed professional business skills, presented final projects

Her Next Play Summer Intern, Edina, MN June 2020 – August 2020

- Research and evaluation of different contact resource management (CRM) options
- Presentation of key information to executives

- Implementation and instruction of new CRM software
- Learned about incredible mission of Her Next Play while expanding network

Technology Experience

- Python used for independent projects, scripts, courses, and summer research
- Use of Julia in personal scripting and honors research project
- Experience with LaTeX for summer research and submission of homework
- Use of Java in Computer Science II and a few outside projects
- Use of Kotlin for personal scripts, animation, Android development, and competitive programming
    - Development of Gustavus Planner and Running Log Android Apps on Github
- C++ for competitive programming and summer research
- HTML and JavaScript for personal projects
    - Math Practice website on GitHub
- Learned C in Computer Organization course
- Microsoft Office and LibreOffice tools
- Use of Windows, Mac, and Linux OS
- Problem Solving: ICPC Coding Contest, Kattis (fjbelik), and Project Euler (fbelik)
- GitHub Account: fbelik