

Suzan Farhang-Sardroodi, M.Sc. Ph.D.

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[Website](#), [GitHub](#), [LinkedIn](#), [Twitter](#), [Google Scholar](#), [PubMed](#)

- Research **Computational Immunology, Clinical Pharmacology**
Machine Learning for Health
- Current Academic Appointment **Research Associate, Department of Pharmacology and Toxicology**
Temerty Faculty of Medicine, Jan 2024-Present
Supervisors: [Dr. Rachel Tyndale](#) (*Professor*)
Departments of Psychiatry, and Pharmacology and Toxicology, University of Toronto
Canada Research Chair in Pharmacogenomics ([CAMH](#))
Toronto, Ontario, Canada
- [Dr. Meghan Chenoweth](#) (*Assistant Professor*)
Department of Psychiatry, University of Toronto
Scientist in Molecular Science at the [Centre for Addiction and Mental Health \(CAMH\)](#)
Toronto, ON, Canada
- Former Academic Appointments **Postdoctoral Researcher**, University of Manitoba, (Université de Montréal)
Department of Mathematics, **Mar 2022-Jan 2024**
Supervisors: [Prof. Stephanie Portet](#) (*Associate Professor*)
[Prof. Julien Arino](#) (*Professor*), Faculty of Science, Department of Mathematics,
University of Manitoba, Winnipeg, MB, Canada
[Prof. Morgan Craig](#), (*Associate professor*), Sainte-Justine University Hospital Research
Centre and Department of Mathematics and Statistics, Université de Montréal
Montréal, Québec, Canada
- Postdoctoral Researcher**, York University
Department of Mathematics and Statistics, **Sep 2020-Feb 2022**
Supervisor: [Prof. Jane Heffernan](#) , Professor, Faculty of Science
Department of Mathematics and Statistics, York University, Toronto, ON, Canada
- Postdoctoral Researcher**, Toronto Metropolitan University (Ryerson University)
Department of Mathematics, **Sep 2018-Aug 2020**
Supervisor: [Prof. Kathleen Wilkie](#) , Associate Professor
Department of Mathematics, Toronto Metropolitan University, Toronto, ON, Canada
- Education **Exchange Semesters**, Department of Applied mathematics
Fall-Winter 2017-2018, University of Waterloo, Waterloo, ON, Canada
- University of Zanjan, Zanjan, Iran**
Ph.D., Solid State Physics (*Evolutionary Graph Theory*) **2014-2018**
(defended on **June 19th**). *Thesis*: [Evolutionary Dynamics on Complex Networks](#)

Summary: We studied the evolutionary properties of mutant and wild type individuals in spatial and temporal fluctuating environments on geographically structured populations. The presence of temporal or spatial variability significantly affects the competition dynamics in populations, and gives rise to some counterintuitive observations. we considered both birth-death (BD) or death–birth (DB) Moran processes on a circular or a complete graph and investigated spatial and temporal variability affecting division and/or death parameters. Assuming that mutant and wild-type fitness parameters are drawn from an identical bimodal distribution, we studied mutant fixation probability and timing. Our results demonstrated that temporal and spatial types of variability possess fundamentally different properties.

Supervisor: [Prof. Amir Hossein Darooneh](#), Professor, Faculty of Sciences
Department of Physics, University of Zanjan

Co-Supervisor: [Prof. Mohammad Kohandel](#), Associate Professor, Faculty of Sciences,
Department of Applied Mathematics, University of Waterloo

Ph.D degree was evaluated by World Education Service, WES, (Reference#4446208/SAA)

Azarbaijan Shahid Madani University, Tabriz, Iran

M.Sc., Particle Physics (High-Energy Physics), 2009-2012, (defended on January 23rd)

Thesis: [Nambu Structures on Four Dimensional Real Lie Groups](#)

Supervisor: [Prof. Adel Rezaei-Aghdam](#), Professor, Department of Physics
Azarbaijan Shahid Madani University

University of Tabriz, Tabriz, Iran

B.Sc., Solid State Physics, 2005-2008, (July, 20th)

Teaching Experience

Department of Mathematics and Statistics, [York University](#)

Instructor, Calculus I, May-August, 2020-2021 (summer term)

Toronto, ON, Canada

[Biomathematics and Fluids Group, Toronto Metropolitan University](#)

Covered some sessions, Calculus I and Calculus III, Mathematical Biology, 2018-2019

Toronto, ON, Canada

[Department of Physics, Faculty of Science, University of Zanjan](#)

Instructor, Elementary Physics, 2016

Instructor, English Language, Jihad Institute, 2014-2018

Co-Instructor, Advanced Mathematical Physics, 2015

Zanja, Zanjan, Iran

Department of Physics, Faculty of Science, Azerbaijan Shahid Madani

University, Teaching Assistant, Statistical Mechanics, 2013-2015

Tabriz, East Azarbayjan, Iran

Skills

Machine Learning [Supervised Learning (Classification, Regression),
Principal Component Analysis (PCA), Clustering],

Deep Learning [Feedforward Neural Networks(FNN)]

Languages: C++, parallelizing with OpenMP

Python (*Libraries: NumPy, Pandas, Scikit-learn, TensorFlow, SciPy, matplotlib.pyplot*)

Julia (*DifferentialEquations.jl, Plots.jl, advanced statistical analysis and modelling packages*), Matlab, **Software:** Mathematica, **Design:** Coreldraw. **Others:** L^AT_EX, Microsoft Office

Awards & Scholarships

GSK Pharmaceutical Industry Fellowship, 2024-2026

Landahl Travel Grant from “Society of Mathematical Biology (SMB)”
Annual Meeting, The Ohio State University (Columbus, Ohio), (July 16-21, 2023)
Supported by: Prof. Laura S. Kubatko Professor of Statistics and of Evolution,
Ecology and Organismal Biology

Travel award from the Moffitt Cancer Center and the Center of Excellence for Evolutionary Therapy, Integrated Mathematical Oncology (IMO) workshop
Cancer Communities (Oct29-Nov5, 2022)

Postdoctoral Fellowship, Khiabani Lab, Rutgers Biomedical and Health Sciences (RBHS), The State University of New Jersey, 2020

Postdoctoral Fellowship, Awarded by Prof. Lennaert Van Veen, OnTechU
North Oshawa Campus, Department of Mathematics, Faculty of Science, 2020

FOS Dean’s Research Fund Travel Award, 2019, *Supported by:*
Prof. Kathleen Wilkie, Associate Professor at Toronto Metropolitan University

Grants from University of Waterloo
Fall-winter, 2017,(Exchange Semester)
Supported by: Prof. Mohammad Kohandel
Associate Professor at the University of Waterloo

Grants from Iran’s Ministry of Science, Research and Technology,
Fall-winter, 2017,(Exchange Semester)
Supported by: Prof. Esmail KaramiDehkordi, Director of
International Scientific Cooperation Office, University of Zanjan 2013-2020

Ph.D. Education Scholarship, Iran’s Ministry of Science, Research and Technology, 2014-2018

M.Sc., Education Scholarship, Iran’s Ministry of Science, Research and Technology, 2009-2011

Conference Presentations

Virtual Seminar, *Department of Biology, faculty of Science*
Memorial University of Newfoundland,(Nov22, 2024)

Workshop Mathematical oncology: at the crossroads of computational fluids, mechanics, and biology, Fields Institute, Toronto, Ontario, Canada, (Nov18-19, 2024)

Poster Presentation, *Multi-Trait Genome-Wide Association Analysis of Psychiatric Traits Identified New Loci*, [American Society of Human Genetics \(ASHG\) Annual Meeting](#) Denver, CO, (Nov5-9, 2024)

Poster Presentation, *Genetic Risk Factors for Concurrent Tobacco Use and Schizophrenia* [Pharmacogenomics Global Research Network \(PGRN\) Scientific Meeting](#) The Ohio State University, (Sep23-25, 2024)

Frontiers in Computational and Mathematical Medicine, Insights into B cell and antibody kinetics against SARS-CoV-2 variants using mathematical modelling
Fields Institute, Toronto, Ontario, Canada, September 23-24, 2024

Leveraging AI for Enhanced Disease Diagnosis: From Viral Infections to Cancer Cachexia
[CAIMS2024 Annual Meeting](#), Queen's University
Kingston, Ontario, Canada, June 26th, 2023

Mechanistic Modeling: From Oncology to Anti-SARS-CoV-2 Immunity
Department of Pharmacology & Toxicology, the University of Toronto
Toronto, Ontario, Canada, November 10th, 2023

Virtual presentation, Physics Colloquium, Topic: *Modeling humoral immune response to SARS-CoV2 and machine learning for discriminating COVID-19 and influenza infection: an application approach*, Institute for Research in Fundamental Sciences School of Physics (IPM). Tehran, Iran, September 4th
<https://physics.ipm.ac.ir/seminars/2023/4sep23/poster.pdf>, 2023

[The VI AMMCS International Conference](#), Topic: *Mathematical modelling of the adaptive immune response: B-lymphocytes and SARS-CoV-2 neutralizing antibodies*
Waterloo, Ontario, Canada, August 14-18, 2023

[Online Video Flash talk, SMB annual meeting](#), Society for Mathematical Biology, Topic: *Mathematical modelling of the humoral and B cell response to SARS-CoV-2*
hosted by Ohio State University, Columbus, Ohio, USA, July 17, 2023

Virtual presentation, [OMNI-RÉUNIS Super-Spreader Seminar Series](#), Topic: *Mathematical Modeling to Identify Optimal Dosing Schedules: From Chemotherapy to COVID-19 vaccines*, hosted by York University, Toronto, Canada, April: 20, 2023

Virtual presentation, [2022-2023 Centre for Mathematical Medicine Seminar](#)
Topic: *Mechanistic mathematical modelling of the within-host response: from chemotherapy to COVID-19*, hosted by Fields Institute, Toronto, Canada
April: 10, 2023

Virtual presentation, Symposium on Machine Learning and Data Modelling in the Biomedical Sciences, ([MLDMBioMed-2022](#)), Topic: *Pharmaceutical and Non-Pharmaceutical Interventions for Controlling the COVID-19 Pandemic*, hosted by York University
Toronto, Ontario, Canada, Sep: 27 - 28, 2022

Virtual Poster Presentation, 12th European Conference on Mathematical and theoretical Biology (ECMTB), topic: *(1)A Machine Learning Approach to Differentiate Between COVID-19 and Influenza Infection Using Synthetic Data, (2)A Multiscale Immune-Epidemiological Model for Coupling Within-Host and Between-Host Dynamics*

Online Video Flash talk, The Royal Society: Modelling the COVID-19 Pandemic: Achievements and Lessons, topic: *Mathematical Modeling of SARS-CoV-2 Immune Escape* London, UK, Jun13th, 2022

Virtual Poster Presentation, DLSPH Biostatistics Research Day, topic: *A Machine Learning Approach to Differentiate Between COVID-19 and Influenza Infection Using Synthetic Data*, virtually hosted by Dalla Lana School of Public Health, University of Toronto, Toronto, Ontario, Canada, May12th, 2022

Virtual Poster Presentation, topic: *Chemotherapy-induced cachexia and model informed dosing to preserve lean mass in cancer treatment*, ISoP QSP Virtual Student Symposium May11th, 2022.

Virtual Poster Presentation, topic: *Mathematical Modeling of SARS-CoV-2 Immune Escape* 5th Workshop on Virus Dynamics, virtually hosted on behalf of Fred Hutchinson Cancer Research Center & University of Washington, Seattle, WA, USA, October 4-6, 2021

SMB annual meeting, Society for Mathematical Biology, topic: *Analysis of host Immunological Response of Adenovirus-Based COVID-19 Vaccines*, virtually hosted on behalf of the University of California Riverside (UCR), USA, 2021

University of Waterloo, Math Oncology Seminar, Topic: *Evolutionary Dynamics of Wild Types and Mutants on a Geographically Structured Population in a Temporal And Spatial Variable Environments*, Waterloo, Canada, March 6th, 2020.

Ontario Tech University, MCSC Seminar, topic: *Mathematical Model of Muscle Wasting in Cancer Cachexia*, Oshawa, Canada, January 14th
<http://mcsc.science.uoit.ca/event/tba-3/>, 2020.

[CMS/SMC, Winter Meeting](#), topic: *Mathematical Model of Muscle Wasting in Cancer Cachexia*, Canadian Mathematical Society, Toronto, Canada, 2019

Ryerson University, Biomathematics and Fluids Seminar, topic: *Mathematical Model of Muscle Wasting in Cancer Cachexia*, Toronto, Canada, 2019

SMB annual meeting, Society for Mathematical Biology, topic: *Mathematical Model of Muscle Wasting in Cancer Cachexia*, University of Montréal, Québec, Canada, 2019

Conferences Organized

Mini-symposium on “Advancing Health and Medicine through Scientific Computing: Mechanistic Modelling, Machine Learning, and Quantitative Systems Pharmacology” [CAIMS2024](#), Kingston, Ontario, Canada, 24-27 June 2024

Mini-symposium on “AI for Enhancing Public Health and Healthcare in Canada” [CAIMS2024](#), Kingston, Ontario, Canada, 24-27 June 2024

Mini-symposium on “Mathematical and computational approaches to modelling immunology”, [CMPD6 workshop](#), Winnipeg, Manitoba Canada, 23-27 May 2023

Workshop on Modelling Immunity, virtually hosted by Fields Institute
Canada, November 1st, 2021

Organizations [Pharmacogenomics Global Research Network \(PGRN\)](#)
[American Society of Human Genetics \(ASHG\)](#)
[HQP Organizing Committee for “OMNI-RÉUNIS Super Spreader Seminar Series”](#)

Languages [Azeri Türkçesi \(Ana Dil\)](#), [Türkçe \(Advanced\)](#), [Persian \(Advanced\)](#), [English \(Advanced\)](#)