Ali Fele-Paranj MSc, MASc, BSc

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Education

- **PhD in Mathematics** — 2025–present
  University of British Columbia · Vancouver, Canada
  Advisors: Miranda Holmes-Cerfon and Lior Silberman.
  Research: statistical physics and stochastic processes.

- **MSc in Mathematics** — 2023–2025
  University of British Columbia · Vancouver, Canada
  Advisor: Leah Edelstein-Keshet. Research: mathematical biology.

- **MASc in Biomedical Engineering** — 2021–2023
  University of British Columbia · Vancouver, Canada
  Advisor: Arman Rahmim. Research: systems biology.

- **BSc in Physics** — 2016–2021
  Sharif University of Technology · Tehran, Iran
  Research: experimental physics.

Research Experience

- **Remote Research Project** — Jul 2020–Mar 2021
  CERN · Remote
  Worked on developing a Paul trap. Project report.

- **Summer Student** — Jul–Aug 2019
  CERN · Geneva, Switzerland
  Used numerical simulations to study an antimatter beamline. Project report.

Teaching Experience

- **Senior Teaching Assistant** — 2023–present
  Math Learning Centre, University of British Columbia
  Teaching support for undergraduate and graduate mathematics courses.

Expository Notes

Selected lecture and self-study notes (linked PDFs).

- Probability I and Stochastic Processes
- Smooth Manifolds — self-study, summer 2024
- Real Analysis I and II
- Partial Differential Equations
- Dynamical Systems

Awards and Honours

- **Early Career Award** — 2022
  Society of Nuclear Medicine and Molecular Imaging.

- **First place, CERN Webfest Hackathon** — 2020
  Developed a platform addressing heart issues in patients with COVID-19 symptoms.

- **CERN Research Fund** — 2019

Publications

Preprints

1. Tighe McAsey, Sushrut Tadwalkar, **Ali Fele-Paranj**, Miranda Holmes-Cerfon. Optimal interactions for addressable self-assembly. *arXiv:2606.31838*, 30 June 2026.

Journal articles and book chapters

1. Jupiter Algorta, **Ali Fele-Paranj**, Jack M. Hughes, Leah Edelstein-Keshet. Modeling and Simulating Single and Collective Cell Motility *Cold Spring Harbor Perspectives volume on Cell Migration*, 2024.
2. **Ali Fele-Paranj**, Babak Saboury, Carlos Uribe, Arman Rahmim. Physiologically based radiopharmacokinetic (PBRPK) modeling to simulate and analyze radiopharmaceutical therapies: studies of non-linearities, multi-bolus injections, and albumin binding. *EJNMMI Radiopharmacy and Chemistry*, 2024.
3. Hamid Abdollahi, Fereshteh Yousefirizi, Isaac Shiri, Julia Brosch-Lenz, Elahe Mollaheydar, **Ali Fele-Paranj**, Kuangyu Shi, Habib Zaidi, Ian Alberts, Madjid Soltani, and others. Theranostic digital twins: Concept, framework and roadmap towards personalized radiopharmaceutical therapies. *Theranostics*, 2024.
4. Hamid Abdollahi, **Ali Fele-Paranj**, Arman Rahmim. Model-Informed Radiopharmaceutical Therapy Optimization: A Study on the Impact of PBPK Model Parameters on Physical, Biological, and Statistical Measures in 177Lu-PSMA Therapy. *Cancers*, 2024.
5. Arman Rahmim, Julia Brosch-Lenz, **Ali Fele-Paranj**, Fereshteh Yousefirizi, Madjid Soltani, Carlos Uribe, Babak Saboury. Theranostic digital twins for personalized radiopharmaceutical therapies: Reimagining theranostics via computational nuclear oncology. *Frontiers in Oncology*, 2022.
6. Hoda Sadeghzadeh, Somayyeh Koohi, **Ali Fele-Paranj**. Free-space Optical Neural Network Based on Optical Nonlinearity and Pooling Operations. *IEEE Access*, 2021.

Work in Preparation

1. **Ali Fele-Paranj**, Leah Edelstein-Keshet. Multiscale Quantification of Vascular Networks: Angiogenesis, Remodeling, and Radiation Effects. Draft.
2. A Data Set of Graph Structure of Human Retina Images. Dataset repository.

Theses

- **MSc thesis in Mathematics** 2025
  University of British Columbia
  Form, function, and remodeling of vascular networks. Advisor: Leah Edelstein-Keshet.

- **MASc thesis in Biomedical Engineering** 2023
  University of British Columbia
  Use of physiologically based radiopharmacokinetic (PBRPK) models to simulate radiopharmaceutical therapies.
  Advisor: Arman Rahmim.

Selected Conferences and Talks

1. **Ali Fele-Paranj**, Leah Edelstein-Keshet. Generation and Evolution of Vascular Networks. *Canadian Society of Mathematics*, 2024.
2. Hamid Abdollahi, **Ali Fele-Paranj**, Arman Rahmim. Enhancing Dose Predictions in Radiopharmaceutical Therapies by Applying Machine Learning to Time-Activity Curve Features: A Simulation Study using PBPK Modeling. *Society of Nuclear Medicine*, 2024.
3. **Ali Fele-Paranj**, Carlos Uribe, Hamid Abdollahi, Elaheh Mollaheydar, Niloufar Zakariaei, Md Shahriar Rahim Siddiqui, Babak Saboury, Arman Rahmim. In Silico Investigation of The Effect of Multi-Bolus Injections in Absorbed Doses to Organs and Tumors in Radiopharmaceutical Therapies. *Society of Nuclear Medicine*, 2023.
4. **Ali Fele-Paranj**, Julia Brosch-Lenz, Carlos Uribe, Babak Saboury, Arman Rahmim. Non-linearities in the transition from imaging radiotracers to therapeutic radiopharmaceuticals. *Society of Nuclear Medicine*, 2022.
5. **Ali Fele-Paranj**, Julia Brosch-Lenz, Carlos Uribe, Arman Rahmim, Babak Saboury. Modular model architecture for radiopharmaceutical therapy planning: Physiologically-Based RadioPharmacoKinetics (PBRPK) implementation. *Society of Nuclear Medicine*, 2022.

Selected Projects

- **LED-operated photocatalytic reactor** 2021
  Designed a reactor with a tunable spectrum using a PyQt interface and STM32 (ARM Cortex-M), for semiconductor-based decomposition of dyes and harmful chemicals in research led by A. Z. Moshfegh.
- **White-light OCT data acquisition system** 2020
  Programmed an FPGA and STM32 microcontroller for high-speed data acquisition and developed a graphical user interface.
- **Neuro Land** 2019
  Educational neural simulation platform with a graphical interface and extensible measurement capabilities.
- **Modular pulsatile heart pump**
  Modular pneumatic pulsatile heart-pump concept for use alongside continuous-flow pumps in operating rooms.

Skills

- **Programming:** Python, C/C++, Java, MATLAB; embedded systems (STM32, embedded Linux).