Dr. Sanjay R Kharche.
President, CEO, and Chief Scientist, MVT in Silico.
Curriculum vitae.
2023.

CITIZENSHIPS. Canadian & British.

EDUCATION.

1. 30/09/1997 – 30/09/2000. Ph.D. in Applied Mathematics. Institution: Department of Applied Mathematics, University of Hull, Hull, UK. Thesis title: "Stefan Problems with Two Dimensional Linearised Perturbations in Their Boundary Geometry or Boundary Conditions."
2. 30/09/2015-30/06/2016. Post-graduate certificate (equivalent to Master's) in secondary science and mathematics education. University of Manchester, Manchester, UK.
3. June 1991 to June 1996. Bachelor's and Master's in physics. Institution: Department of Physics, University of Pune, India. First class with distinction.

RECENT APPOINTMENTS.

July 2023 to present. CEO of MVT in Silico. (100% ownership).

August 2016 to June 2024: Research Scientist (Western University, Canada).
My primary duties are to lead the PM^3 laboratory to investigate vascular and electrophysiological processes in health and disease; generate external funding applications; provide UG and PG research training to upcoming HQPs; and undertake teaching.

January 2019 to January 2021: Assistant Professor/course Instructor (teaching) in Applied Mathematics, Western University. In this role, I taught first year applied mathematics to students from a medical sciences and biology background. The BMSc course title is "Ordinary differential equations and probability theory." (UWO code: AM1201B).

TEACHING EXPERIENCE.

January 2019 to 2021: Instructor for the course AM1201B in Western University's mathematics department.

Summer 2020: I designed and delivered a training course to my two postgraduate students. The teaching involved vascular pathophysiology, biophysics, ordinary and partial differential equations, and numerical methods. The teaching was delivered online and synchronously. The contents of the lectures are organized into a course manual and available openly at the link: shorturl.at/jmH47 .

August 2016 to date: I have assisted Prof. Daniel Goldman (Associate Professor of Medical Biophysics and Applied Mathematics, Western University) in delivering his 3rd year course.

September 2015 to July 2016: I gained experience in teaching 12 to 19 year olds (high school computer science, physics, biology, and mathematics) during my postgraduate certificate in education (PGCE) training when I worked in both special needs and private secondary schools.

September 1997-September 2000: I worked as a graduate teaching assistant in the Department of Applied Mathematics, University of Hull, UK, where I taught calculus and algebra.

TECHNICAL EXPERTISE.

I am the lead developer of PM^3 (Precision Medicine using Mathematical Modelling) platforms that I use to mechanistically

investigate **a)** multi-scale blood flow phenomena; **b)** cellular and molecular electrophysiology; and **c)** to undertake image processing. My platforms, computer models, and data repositories are open source that are designed for application in pre-clinical research and clinical trials. In recent years, I have up taken computational platforms to assist my research into blood flow dynamics, CT, μCT, and intravital microscopy imaging, which I will build upon in the immediate future. I routinely develop my own methods.

RECENT INVITED TALKS.

1. Title: "Multi-scale modeling of cardiac arrythmia". Date: August, 2017. Venue: Department of Applied Mathematics, Western University, Canada.
2. Title: "Sensitivity analysis and blood flow modelling". Date: June 2018. Venue: Department of Computer Science, University of Oxford, UK.
3. Title: "Interpreting CT perfusion data for the effects of dialysis". Date: May 2019. Venue: Kidney Clinical Research Unit, Victoria Hospital, Lawson Health Research Institute, London, Ontario.
4. Title: "Blood flow and arrhythmia modelling: A multi-physics approach". Date: July 2020. Venue: Department of Mathematics, University of Waterloo, Canada. (virtual).
5. Title: "Fractional flow reserve, a large data application". Date: May 2022. Venue: Montreal Conference Centre, Canarie Research Software Conference, Montreal.
6. Title: "Seeking collaborations among engineers, mathematicians, and computer scientists: A deployment of digital twins.". Date: July 2022. Venue: Department of Computer Science and Software, McMaster University, Canada.
7. Title: "Application of CFD models in systems biology". Date: August 2022. Venue: Systems Medicine Laboratory, University of Florida, USA. (virtual).

CONFERENCE ORGANISATION.

- Co-organiser of BeatBox software workshop, Manchester UK, 24-25 June 2013.
- I organize the annual Western University PM^3-SimVascular workshops since September 2020 to date.

GRANTS AWARDED.

1. Funder: Canarie Inc. Value: $300,000. Title: "Simulation of blood flow for risk assessment in human". PI: CW McIntyre. Co-Is: D. Goldman and **SR Kharche.** I developed this grant application and secured the funding. I am the lead developer and co-investigator in this project. I will build upon the outcomes of this project.
2. Funder: Heart and Stroke Foundation bridging grant. Value: $40,000. Title: "Validation of an ECG based arrythmia risk assessment method using inverse solutions." PI: CW McIntyre. Co-Is: **SR Kharche**, Ting Lee, Alan Skaynes, et al.
3. MITACS GlobaLink Canada. Value: $45,000 per annum. I have been awarded international interns each year since 2018 to date. To date, I have supervised eight international interns that present the potential to become students in Canadian universities.

FELLOWSHIPS AND AWARDS.

Fellowship: 15/07/2011- 10/09/ 2011. HPC Europa 2011 Visiting Fellowship, CINECA, Bologna, Italy. Project: Development of 1D and 2D parallel bi-domain solvers. **(PI).**

Awards:
1) Winner of "Physics Association" prizes during undergraduate and postgraduate studies.
2) Union Grants Commission (India) funded scholar during undergraduate and postgraduate studies.
3) Winner of Graduate Teaching Assistantship during Ph.D. in University of Hull, UK.

JOURNAL PEER REVIEW EXPERIENCE.

- Review editor of Frontiers in Physiology since May 2018. I have reviewed over 50 manuscripts over the past 6 years.
- Guest lead editor of special issue in Frontiers in Physiology Computational in 2020. Special issue titled: "Vascular Disease Multi-Scale Multi-Physics Modelling and Experimental Data." My co-editors are Profs. Daniel Goldman (Western University) and Halina Dobrzynski (University of Manchester, UK).
- Reviewer of following journals: Nature Translational Psychiatry, Plos Computational Biology, Plos ONE, Journal of Physiology, MDPI journals, Computers in Medicine, Chaos, Biophysical Journal, American Journal of Physiology, IEEE journals.
- Editor for Frontiers in Physiology, BMC Cardiovascular Disorders.
- Grants reviewing experience: I have reviewed a grant application for the UK Engineering and Physical Research Council. Recently, I have acquired training regarding the review process of Canadian CIHR and NSERC grants. I recently provided reviewer service to Digital Research Alliance of Canada's competition entitled Data Champions, where I reviewed 6 applications.

LEADERSHIP.

I have acquired external research funding to support my computational medicine laboratory, nominally termed PM^3 laboratory. I have trained two graduate students as HQPs and mentored numerous undergraduates.

SERVICE.

- I have led a special issue in Frontiers in Physiology (Computational medicine and biology) titled: "Vascular Disease Multi-Scale Multi-Physics Modelling and Experimental Data".
- In 2020, I have served on the admissions committee for Schulich School of Medicine, UWO.

MANAGEMENT EXPERIENCE.

I am responsible for planning, documenting, and reporting of progress related to my project (#1 in GRANTS AWARDED above). I routinely attend departmental and committee meetings to align with institutional direction.

RECENT STUDENT SUPERVISION ACTIVITY.

I have previously supervised over 34 final year undergraduate thesis reports between 2016 to 2020. I have supervised two master's post-graduates and 8 undergraduates (4^{th} year research projects). I have supervised one project manager employee.