Padhu Seshaiyer, PhD

Professor, Mathematical Sciences
Director, Center for Outreach, Mathematical Professional Learning and Educational Technology

Education

PhD, Applied Mathematics, University of Maryland, Baltimore County

Key Interests

Computational Mathematics | Computational Biomechanics | Mathematical Modeling | STEM Education | Scientific Computing | Sustainable Development Goals

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SELECT PUBLICATIONS

> Seshaiyer, P. and McNeely, C.L. (2020). Challenges and opportunities from COVID-19 for global sustainable development. *World Medical & Health Policy.*

> Seshaiyer, P. and Lenhart, S. (2020). Connecting with teachers through modeling in mathematical biology. *Bulletin of Mathematical Biology*, 82, 98.

> Matto, H. and Seshaiyer, P. (2018). Harnessing the power of the recovering brain to promote recovery commitment and reduce relapse risk. *Journal of the Society for Social Work and Research* 9(2), 341-358.

Research Focus

I have initiated and directed several research and educational programs including graduate and undergraduate research, K-12 outreach, teacher professional development, and enrichment programs to foster the interest of students and teachers in STEM at all levels. My research in computational mathematics includes the development of new analytical techniques and efficient algorithms to obtain numerical solutions to differential equations describing multi-physics interactions. My research in computational bio-mechanics includes developing, extending and applying mathematics for the purposes of better understanding the physiology and pathophysiology of the human vascular system. My research in teacher education involves studying effective pedagogical practices to improve student learning. I am also engaged in applying design and systems thinking to solve complex challenges such as the SDG2030 goals using STEM based solutions. Integrated with the research plan is an education plan where the primary goal is to teach students and teachers at all levels to apply well-developed research concepts, to fundamental applications arising in STEM disciplines.

Current Projects

- The proposed RAPID research on "Modeling, Analysis and Control of COVID-19 Spread in an Aircraft Cabin using Physics Informed Deep Learning", will build a robust, reliable and scalable computational software that can be used to predict the spread of COVID-19 in an aircraft cabin.

- The IMMERSION (Investigating Mathematical Modeling, Experiential Learning and Research through Professional Development and an Integrated Online Network for Elementary Teachers) project will design and deliver professional development for elementary grades mathematics teachers and will result in curriculum modules that focus on mathematical modeling in the elementary grades. the modeling process.

- The Impact of COVID-19 on the UN Sustainable Development Goals.