

ICMME 2023

Pre- Conference Talk Series

Talk - 01

Analyze real-world Phenomena Using Mathematical Models of Ordinary Differential Equations

In our day-to-day life, we can observe a lot of happenings. The motion of a rocket, the stretch of an elastic, compression of a spring, etc. Some events such as the growth of the compound interest of a bank deposit, the increment of the height of a plant, and some chemical reactions happen very slowly and are simply unobservable by the naked eye. In the present world, there are severe problems, including climate change, natural disasters, population growth, diseases, etc. Despite their different nature, all these events can be mathematically modeled using Ordinary Differential Equations. This shows that Ordinary Differential Equations are an important tool used to convert real-world incidents into mathematical problems. We can find equilibrium points of a differential equation, which are some critical points describing a steady level of underlying incident/phenomenon. Further, we can analyze the sensitivity of the differential equation to understand how each parameter has affected the final output of real-world incidents. Then, we solve the differential equation, apply a time series analysis, and use the results to make future predictions of each incident. In many cases, it is impossible to solve differential equations analytically, and in such a situation we use mathematical software to solve them numerically. MATLAB, Mathematica, Maple, and Wolfram Alpha are some popular software we use in that regards.



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Dr. Rohana Kumara Vithanage is currently a lecturer at the Department of Mathematical Sciences, Faculty of Applied Sciences, Wayamba University of Sri Lanka. He completed his Ph.D. in 2022 at Texas Tech University, Lubbock, USA under the guidance of Prof. Sophia Jang. His research interests are in the field of Bifurcation Theory and its applications in Mathematical Biology. Further, he has specialized in the Mathematical Modeling of Cancer- Immune Interactions.

Date : Friday, 10th of February 2023
Time : 6.00 p.m. onward

The talk will be conducted on bilingual



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