



University of Hyderabad  
School of Mathematics and Statistics

Cordially invites you to  
A Public Lecture on the topic  
**“Computer Arithmetic-How Computers do the Math?”**



Mr. Urvish Markad

**Abstract:**

The computer arithmetic is one of the important aspects of digital design that has been given a very less importance possibly due to avoid the mathematical nuances that would obstruct the heavy dose of abstract programming. Consequently, one fails to appreciate the prima facie of how computers were indeed developed to do the number crunching. In the guest lecture, I plan to demystify the intricacies of the subject by expounding on two basic data types viz., floating-point and fixed-point aka. int and how is the corresponding computer architecture implemented to realize the same. There has been a recent traction on this subject owing to the usefulness of each of these data types for ML training and inference respectively. I'm planning to give a 'mathematician's perspective' to these ideas which will help choose the (right?) format for the desired application. I first learnt about this from Prof. Nitin Chandrachoodan (IIT Madras) during my tenure as a Research Associate at IIT Madras. Also, during my current tenure as a DSP Design Engineer at AMD, I lately invented a class of algorithms for approximate fast floating-point arithmetic which help me connect the dots of various theoretical concepts learnt during undergrad.

My very first motivation for the subject started as I studied the life of Prof. Richard Crandall, an eccentric professor who tried to test primality of gigantic numbers using computer (Apple's Macintosh), and later went on to become the chief cryptographer at Apple, Inc. His book on the same topic, Prime: A computational perspective, co-authored by Carl Pomerance is indeed a gem. I truly believed that computer are at the rescue of humans when it comes to number crunching. While a pile of data lies unprocessed before us and others are busy building (inefficient?:P) data centers, I invite you to spend some time to sharpen the axe before chopping down the forest!

**All are invited**

***Date: 30<sup>th</sup> October, 2023***

***Time: 4.00 P.M***

***Venue: Seminar Hall-2, School of Mathematics and Statistics***