

NEW TRENDS IN APPLICATIONS OF MATHEMATICS TO COMPUTER SCIENCE.

P. S. AVADHANI

Former Director, IIT, Agartala &
Former Principal, College of Engineering(A), Andhra University,
Visakhapatnam
Email: psavadhani@yahoo.com

Mathematics has been the backbone for many inventions and technological developments. At the same time, some people thought some branches of mathematics like Number Theory are useful only for mental happiness. However, all these branches of Mathematics, especially Number theory has been very useful in recent years in the areas of cyber security. The aim of this talk is to discuss about some applications of mathematics which are fundamental to the new trends in computer science and its applications. These include Number Theory Linear Algebra, Graph theory, Operations Research and Computational Geometry.

The computational difficulty in factoring large numbers and the difficulty in establishing the primality of a number, partitions of numbers are some of the ideas in number theory will be touched upon. The concepts of Linear Algebra have provided a good foundation in the applications of Data Analytics which is a part of Machine Learning. Graph Theory has provided many insights into the modeling and simplification of Computer Networks while the concepts from Computational Geometry were helpful in Solid Modeling and Robotics. As usual Operations Research has been the backbone for efficient handling of all the resources and led to new areas such as Bio-inspired Computing.

This lecture introduces some of these concepts which can be taken up further by those students who want to pursue research in these areas.

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