Title: How to Store Elephants?

Speaker: Professor Manish K Gupta (Dhirubhai Ambani Institute of Information and Communication Technology, Gandhinagar)

Date and time: 28th July 2022 (Thursday), 4 PM

Venue: Room 101, H R Kadim Diwan Building (KD 101), CSE Department

Abstract:

Storage has been a fundamental need for every life on the planet. For example, Ants store food and Humans store data. Life has chosen DNA to store the blueprint of life. Storage is also a basic computing primitive. Unless you store the data you cannot process it. The representation of information can give you a different format for data storage. Humans are storing data from a very ancient time. Modern Humans are generating data every day from digital media such as cameras, Internet, phone, sensors and there is a pressing need for a technology that can store this data in the dense storage medium. It is predicted that soon the data generated will be in the order of Geopbytes from the Internet of Things. At present to store such big data we need large space and also it is very costly. Synthetic data storage seems to be the right technology emerging on the horizon. In 2013, Scientists showed how to store data on synthetic DNA with storage capacity of 2.2 petabytes on one gram of DNA. One can store 455 exabytes of data in one gram of DNA. This talk will give a brief overview of our recent work in this new emerging area of DNA based data storage.

Speaker bio:

Manish K. Gupta received his BSc (Physics, Chemistry, and Mathematics) and MSc (Mathematics) degrees from the University of Lucknow, India, in 1990 and 1992, respectively, and his Ph.D. degree in Mathematics in 2000 from the Indian Institute of Technology, Kanpur, India. He has held various academic positions at the University of Canterbury, Christchurch, New Zealand (2000-2002); National University of Singapore, Singapore (2001); Arizona State University, USA (2002-2004); The Ohio State University, USA (2004-2005); Queens University, Canada (2005-2006); King Abdulaziz University, Saudi Arabia (2019), and Fraunhofer Institute for Cell Therapy and Immunology (IZI), Germany (2019). Since 2006, he has been with the Dhirubhai Ambani Institute of Information and Communication Technology (DA-IICT), Gandhinagar, India and currently works as a Professor. He is a senior member of the IEEE and a member of IEEE Computer Society. Since 2010, he has been a member of the American Mathematical Society. Gupta has served as a board member of the Indo-American Education Society, United States-India Educational Foundation (IAES-USIEF) Satellite Center (affiliated with the US Department of State's Bureau of Educational and Cultural Affairs), Ahmedabad, India, from 2008 to 2015 and Gupta is a founder of the DA-IICT Centre for Entrepreneurship and Incubation (DCEI) a section 8 not for profit company since 2006 and served as the chairman of the DCEI executive council from July 2016 till March 2019. Gupta also serves on numerous government committees. He has been selected as a featured reviewer of the ACM Computing Reviews February 2016 issue. He is serving as an IEEE Computer Society Distinguished Visitor from 2022-2024. Gupta also serves on the editorial board of the Journal of Applied Mathematics and Computation, Springer and AIMS Electronics and Electrical Engineering, AIMS press from 2017. His group (http://www.guptalab.org) is well known for developing open-source software products (for example, DNA Pen, 3DNA, DNA Cloud) in DNA nanotechnology. His areas of interest are the elegant applications of mathematics in emerging technologies.