

# Codes for Distributive Storage

## Overview

Distributed Storage Systems (DSSs) are an integral part of modern data centres which support large-scale computing applications such as those provided by Google, Facebook, Amazon and Microsoft. Mostly this technology has evolved by using inexpensive disks which are then distributed and connected through modern communication networks. Erasure and error correcting codes play a vital role in achieving reliability of the stored data. This course combines the basics of error correcting codes and distributed network concepts to illustrate the design principles of this technology.

-- Objectives

The primary objectives of the course are as follows:

- i) Exposing participants to the state of the art in codes for distributive storage systems with practical applications.
- ii) Building the confidence and capability of the participants in applying advanced error control coding methods to design scalable, distributive storage systems that can store large volume of data.

<b>Course Information</b>	<b>Duration:</b> July 1 <sup>st</sup> -July 10 <sup>th</sup> 2017 <b>Total Contact Hours:</b> 30 hours in 10 days <b>Course Website:</b> <a href="http://www.iitk.ac.in/ee/wireless/">http://www.iitk.ac.in/ee/wireless/</a>
<b>Modules</b>	<b>A: Fundamentals of erasure codes and coding theory:</b> Jul 1 <sup>st</sup> -3 <sup>rd</sup> 2017 <b>B: Advanced coding topics:</b> Jul 3 <sup>rd</sup> -5 <sup>th</sup> 2017 <b>C: Distributed systems concepts:</b> Jul 5 <sup>th</sup> -7 <sup>th</sup> 2017 <b>D: Hadoop Distributed File System and a practical implementation:</b> Jul 7 <sup>th</sup> -10 <sup>th</sup> 2017
<b>You Should Attend if</b>	<ul style="list-style-type: none"> <li>▪ you are a practicing computer networks and communications engineer, storage professional, system and data administrator.</li> <li>▪ you are a student or faculty from academic institution research in coding theory, communications and computing</li> </ul> <b>Pre-requisite:</b> Prior knowledge in Probability Theory, Linear Algebra and Digital Communications is desirable.
<b>Fees</b>	<p>The participation fees for taking the course is as follows:</p> <p><b>Industry/ Research Organizations: Rs. 10000 + 15% service tax (Total: Rs. 11500)</b>  <b>Academic Institutions (Faculty): Rs. 5000 + 15% service tax (Total: Rs. 5750)</b>  <b>Academic Institutions (Students): Rs. 2000 + 15% service tax (Total: Rs. 2300)</b>  <b>Academic Institutions (SC/ST Students) : Rs. 1000 + 15% service tax (Total: Rs. 1150)</b></p> <p>Students have to submit a letter from their institute as proof of full time student enrollment. SC/ST students will have to submit a valid Caste/Tribe Certificate.</p> <p>The above fee entitles participants to attend all the lectures. Boarding, lodging and meal charges are not included in the fees. The participants will be provided shared accommodation in Visitor's Hostel/Visitor's Hostel Extension on payment basis.</p>

## The Faculty



**Udaya Parampalli** (aka Parampalli Udaya) is an Associate Professor and reader in the Department of Computing and Information Systems, the University of Melbourne. He obtained his Ph.D from Indian Institute of Technology (I.I.T), Kanpur, in 1993. From 1992 to July 1996, he worked in industry as a Member Research Staff at Central Research Laboratory, Bharat Electronics, Bangalore. From 1997 to 2000, he was an ARC research associate at the Department of Mathematics, RMIT University, Melbourne, Australia. In the second half of 2008, he was a Visiting Professor in Department of Computer Science at University of Calgary, Canada. Udaya is a Senior Member of IEEE. Udaya's research interests are in the area of cryptography and sequences over finite fields and rings for communications and information security.



**Aaron Harwood** is a Senior Lecturer in the Department of Computer Science and Software Engineering at The University of Melbourne. Aaron is well known internationally for his contributions in the areas of Peer-to-Peer Computing and High Performance Interconnection Networks. He is especially well known for his work on peer-to-peer algorithms, decentralized protocols and large scale, high performance systems. His research publications include top ranked computer science journals such as ACM/IEEE Transactions and the VLDB Journal, achieving a H-Index of 16 and a G-Index of 25 (as of Feb/2016).



**Adrish Banerjee** received his Bachelors degree from Indian Institute of Technology, Kharagpur and Masters and Ph.D. degree from University of Notre Dame, Indiana. He is currently an Associate Professor in the Department of Electrical Engineering at Indian Institute of Technology, Kanpur. He is a recipient of Microsoft Research India young faculty award, Institute of Engineers India young engineer award, and IETE-Prof. Sreenivasan Memorial Award-2016. His research interests are in the physical layer aspects of wireless communications, particularly error control coding, cognitive radio and green communications.

## Course Co-ordinators:

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Registration:

<http://www.gian.iitkgp.ac.in/GREGN>

Course Website:

<http://www.iitk.ac.in/ee/wireless>