



Goa University

**Faculty of Natural Sciences  
Organizes**

**Four day Workshop on**

**“Data Science and Applications”**

**From**

**27th -30th March 2017**

**Under UGC XIIth Plan**

Venue : Council Hall and Department Of Computer Science & Technology  
Goa University



## Sub: Invitation for Four-day workshop on "Data Science and Applications"

2 messages

Venkatesh Kamat &lt;vvkamat@unigoa.ac.in&gt;

Mon, Mar 20, 2017 at 11:05 PM

To: Vijay Borges <vb@gec.ac.in>, Devaki Sincro <devaki.sincro@gmail.com>, Maruska Mascarehnes <maruska@gec.ac.in>, "Dr. Laxminarayana J A" <jal@gec.ac.in>, Maria Choudhary <maria.choudhary@oracle.com>, Kissan Dessai <kissangd@gmail.com>, Nilesh Fal Dessai <nfd@gec.ac.in>, Venkatesh Prabhu <nothingsmine@gmail.com>, Shenkar Naik <xekhar@rediffmail.com>, Mahesh Matha <maheshmatha@gmail.com>, prajyot mainkar <prajyotmainkar@gmail.com>, Shraddha Barve <ynb994@gmail.com>, Chitra Nayagam <chitrasenthil@hotmail.com>, sangeeta jadhav <sangeetafromgoa@gmail.com>, Shilpa Desai <sndesai@gmail.com>, shilpa\_deodhar31@yahoo.com, shailasardessai <shailasardessai@yahoo.co.in>, Kavita Asnani <kavitapcce@gmail.com>, "Mr. Ramrao Wagh" <ramrao@unigoa.ac.in>, Venkatesh Kamat <vvkamat@gmail.com>, Jyoti Pawar <jyotidpawar@gmail.com>, Gajanan Gawde <gajanan.s.gawde@gmail.com>, faculty <faculty@unigoa.ac.in>, Kundaikar Teja Chudu <dcst.teja@unigoa.ac.in>, Teja Kundaikar <tkundaikar10@gmail.com>, Manika Bindal <manika.bindal@gmail.com>, Palaash Sawant <palaash77@gmail.com>, Prathmi Kurtiker <kurtikerprathmi@gmail.com>, Gaurish Thakkar <thak123@gmail.com>, Ruchi Parkar <ruchiparkar25@gmail.com>, Radhiya Arsekar <radhiya.arsekar@gmail.com>, akshata phadte <akshataph07@gmail.com>, Vaze Pooja Ashok <mtech.vaze@unigoa.ac.in>, Sneha kamble <sneha311093kamble@gmail.com>, Poonam Navelker <poonam.navelker@gmail.com>, Prasann M <prasannm@gmail.com>, Rucha Joshi <ruchajoshi.11@gmail.com>, Ashweta Fondekar <ashu.fondekar57@gmail.com>, Nilkanth Shirodkar <tatya922050@gmail.com>, Milind Shivolkar <milind.shivolkar@gmail.com>, Likita Shetty <likitashetty07@gmail.com>, priya lotlikar <lotlikarpriya@gmail.com>, Rumana Pathan <rumana2492@gmail.com>, Shrikrishna parab <amayparab18@gmail.com>, Sunayana Gawde <sunayanagawde17@gmail.com>, Sharmila Naik <sharmila21@gmail.com>, dcst <dcst@unigoa.ac.in>, solly bennet <sollybennet@gmail.com>, annie rajan <ann\_raj\_2000@yahoo.com>, Vandana Naik <vandanaik@gmail.com>, Razia de Loyola Furtado e Sardinha <razia.sardinha@gmail.com>, Swapnil Fadte <swapnil.fadte@unigoa.ac.in>, Deepali Tatkar <deepalitatkar27@gmail.com>, Gargi Alavani <garg.alavani@gmail.com>

Dear Sir/Madam,

Faculty of Natural Science, Goa University is organizing 4-day workshop from 27-30 March 2017 on the theme "Data Science and Applications" for the benefit of Faculty, Master's Students and PhD Scholars. The primary objective of the workshop is to provide insight into the mathematics and algorithms that underpin analysis of large data sets involving numerical data, textual data, images and videos.

The workshop will benefit Master's and PhD students who are in the early stage of thesis/research and interested to listen to leading experts from industry and academia working in the area of Data Sciences.

Workshop seats are limited to 25 and first preference will be given to PhD scholars and M.Tech/M.E students followed by Faculty from colleges affiliated to Goa University. There are no fees for attending the workshop and the certificate of participation will issued to only those who attend all four days. Other participants will be issued a certificate of attendance based on the session they attend.

The list of resource persons and schedule of the the workshop is given below:

Sr. No	Faculty	Topic	Institute
1	Amit Deshpande (AD)	Linear Algebra in Data Science	Microsoft Research, Bangalore
2	T. Veena (TV)	SVM: A Kernel Method for Speech and Image Analysis	CSE, NIT Goa
3	Ashwin Srinivasan (AS)	Statistics for Machine Learning	CS, BITS, Goa
4	Venu Madhav (VM)	Geometric Estimation in Computer Vision	EE, IISc. Bangalore

5	Uma K. Mudengudi (UM)	3D Reconstruction & Detection of Doctoring	ECE, KLE University, Hubli
6	Ujwala Patil (UP)	Super Resolution & Data Fusion	ECE, KLE University, Hubli
7	Abhiram Ranade (AR)	Mathematical Modelling and Combinatorial Optimisation	CSE, IIT Bombay
8	Sujatha C (SC)	Video Summarization	CSE, KLE University, Hubli

Venue and Schedule of the workshop is as follows:

Workshop Schedule		Mon	Tue	Wed	Thu
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	10:00 – 11:15	AD	UP	AR	UM
	11:30 – 12:45	AD	UP	AR	UM
Afternoon	Venue	Dept. CST	Admin Bldg.	Admin Bldg.	Dept. CST
	2:00 – 3:15	TV	SC	AS	VM
	3:30 – 4:45	TV	SC	AS	VM

For registration please click on the link: <http://tinyurl.com/unigoa>

Kindly circulate this email among students and colleagues and encourage them to register for the workshop. For any query related to workshop, please contact Gaurang Bane on 9881425995 or Swapnil Fadte 9762311505.

V. V. Kamat

(Workshop Coordinator)

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V. V. Kamat, PhD

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Please access the attached hyperlink for an important electronic communications disclaimer:<http://www.unigoa.ac.in/Disclaimer.php>

Venkatesh Kamat <[vvkamat@unigoa.ac.in](mailto:vvkamat@unigoa.ac.in)>  
To: University <[university@unigoa.ac.in](mailto:university@unigoa.ac.in)>

Tue, Mar 21, 2017 at 2:38 PM

**Four-day Workshop on Data Science and Applications**  
**27th - 30th March 2017**

Faculty of Natural Science, Goa University is organizing 4-day workshop from 27-30 March 2017 on the theme "Data Science and Applications". Next year, ACM IKDD Conference on Data Sciences (CODS) along with COMAD is going to be held at Goa University from 11-13 Jan 2018. As a precursor to that event, we are planning to organize couple of workshops to enthuse local researchers and increase their participation in the conference. This workshop is conceived on those lines. The primary objective of the workshop is to provide insight into the mathematics and algorithms that underpin analysis of large data sets involving numerical data, textual data, images and videos.

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V. V. Kamat  
(Workshop Coordinator)

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**27th - 30th March 2017**

**Organized by Faculty of Natural Science**

**Under UGC XII Plan Grants**

**Venue: Council Hall and Department of Computer Science & Technology**

**For Details and Registration Visit University Website ([www.unigoa.ac.in](http://www.unigoa.ac.in))**

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V. V. Kamat  
(Workshop Coordinator)

**27/03/2017 (Day 1)**

**Session 1 : Amit Deshpande - Linear Algebra in Data Science**

#### **About Talk**

In data-driven decision-making, algorithms use many linear algebraic techniques to explore, understand and visualize data. In these talks, we will look at a few of these techniques, namely, the random projection, PCA (Principal Component Analysis), DPPs (Determinantal Point Processes) etc., and their applications to clustering, summarization, dimension reduction, inference, and optimization in data science and machine learning.

**Session 2 : T. Veena - SVM: A Kernel Method for Speech and Image Analysis**

**28/03/2017 (Day 2)**

**Session 1 : Ujwala Patil & Ramesh Tabib - Image Fusion and Registration**

Image fusion is a technique of combining multiple registered images to get more informative image. The problems associated with the monocular imaging system is that spatial and spectral resolution of imaging system limits the information of single image. The main objective of the image fusion is to combine multiple images of the same scene taken at different instances, from different viewpoints and/or by different sensors in order to provide complete understanding of the scene not only in terms of position and geometry, but also semantic interpretation. Image fusion techniques integrate image information from multiple images to aid in different applications of image processing. We focus to obtain more informative image from multiple observations of the same scene. Typically image fusion problem is addressed at pixel level, region level, feature level and decision level.

Image fusion is sensitive to the registration of input observations. Image registration is a technique used to align multiple scenes into a single integrated image. It helps overcome issues such as image rotation, scale, and skew which are common when overlaying images. The source images should be



registered to avoid the artifacts in the fused image. We consider image registration as an iterative optimization problem with the goal of finding the spatial mapping to bring input images into alignment. We discuss hierarchical method of Image registration using different qualitative parameters to justify the alignment.

## **Session 2 : Sujatha C - Video Summarization**

**29/03/2017 (Day 3)**

### **Session 1 : Abhiram Ranade - Mathematical Modelling and Combinatorial Optimisation**

#### **About Talk:** Mathematical Modelling

We will discuss how a number of optimisation problems in transportation can be modelled and solved using combinatorial approaches as well as mathematical programming.

#### **About Talk:** Maximum Likelihood Genome Assembly

A generative model is proposed for how genomes are split into fragments and then used for maximum likelihood assembly. The problem can then be solved using convex optimisation.

## **Session 2 : Ashwin Srinivasan -Introductory Probability and Statistics for Machine Learning**

#### **About Talk:**

Data-driven computation is now a ubiquitous feature of variety of programs designed for estimation, modeling and inference. In all cases, the starting point is an assumption that there is now so much data about a system being studied, that it is possible to answer practically any kind of question about the system by statistical modelling, estimation and inference (thus giving a modern twist to Leibniz' exhortation "Let us calculate!"). Two developments have been driving this pervasive growth of data. First, it has become increasingly easier to generate data in an automated manner, due to algorithmic and technological advances. Secondly, from 1990, mass storage (disk) capacity has been roughly doubling every year, keeping up with the demands of machine-generated data. Combined with significant increases in computational power, there are now a range of new techniques for the computational modelling of data using a combination of probability, statistics, computer science, and visualisation. The tools needed to start exploring this world of data-driven computation are, unsurprisingly, ones from probability and statistics. These lectures will cover some of the basics needed from these areas. I expect to cover the following topics: (1) Statistical Data; (2) Introduction to Frequency Distributions; (3) Sampling and Estimation; (4) Probability Distributions; (5) Maximum Likelihood models; (6) Conjugate priors and MAP models; (7) The EM algorithm; and (8) Basics of Bayesian Networks.

**30/03/2017 (Day 4)**

### **Session 1 : Uma K. Mudengudi - 3D Reconstruction & Detection of Doctoring**

## **Session 2 : Venu Madhav - Geometric Estimation in Computer Vision**

In this talk I will introduce the geometry of images as well as estimation/optimization issues of relevance. In the process, a solution for large-scale 3D reconstruction using camera images will be developed.