



Big Data Analysis through Copula

Overview

Data analysis technique is very useful to analyze big data such as biological data, financial data, spatial-temporal data collected from Biology, Economics, Engineering, Environment science and Geology disciplines. By a theorem due to Sklar in 1959, a multivariate distribution can be represented in terms of its underlying margins by binding them together a copula function. Copulas are useful devices to explain the dependence structure between variables by eliminating the influence of marginal functions. A copula method for understanding multivariate distributions has a relatively short history in statistics literature; most of the statistical applications have arisen in the last twenty years. In this course, diverse approaches to directional dependence via copula will be introduced with real examples using histone gene data, financial data, and psychology data. In addition, the course will introduce how to use copula function to Data Science such as text mining, spatial data analysis and quality control.

The objectives of the course are:

- i). To bring closer to the students vast applications of R programming to modern methods for analysis,
- ii). To provide an introduction to the theory of copula using sophisticated computational programming R,
- iii). To expose the participants to the theory and applications of functional data analysis using copula,
- iv). To learn imputation techniques for complex data using copula.

Participants will gain some advance knowledge on above topics through lectures and tutorials with hands-on experiments. Also case studies and assignments will be shared to stimulate research motivation of participants.

Course Schedule	December 11-16, 2023 Number of participants for the course will be limited to fifty.												
You Should Attend If...	<ul style="list-style-type: none"> ▪ You are a Ph.D. scholar or a student have enrolled for one of the following degree programme: MBA/BBA/MCA/BCA/M.Tech/B.Tech/MSc/BSc or completed. ▪ You are a faculty member executive/business analyst/financial analyst/banker/scientist. Some quantitative background in Mathematics/Statistics/Data Analysis may be an advantage. 												
Course Fee	<p>One-time GIAN Registration: Please visit http://www.gian.iitkgp.ac.in/GREGN/index and register by paying Rs 500/- (those who have already been registered and paid, need not again) then opt the course under course registration tab and save. After completing this process please inform to the course coordinator by e-mail. The participation fees for taking the course is as follows:</p> <table style="width: 100%; border: none;"> <tr> <td>Participants from abroad :</td> <td style="text-align: right;">US \$ 125</td> </tr> <tr> <td>Industry/Research Organizations :</td> <td style="text-align: right;">Rs. 2500</td> </tr> <tr> <td>Academic Institutions :</td> <td></td> </tr> <tr> <td style="padding-left: 20px;">a) Faculty :</td> <td style="text-align: right;">Rs. 2000</td> </tr> <tr> <td style="padding-left: 20px;">b) Ph.D. Scholar :</td> <td style="text-align: right;">Rs. 1500</td> </tr> <tr> <td style="padding-left: 20px;">c) UG/PG Student :</td> <td style="text-align: right;">Rs. 1000</td> </tr> </table> <p>The above fees include all instructional materials kit, certificate, use of computer facilities for tutorials and assignments, 24 hour free internet facility. The participants will be provided accommodation on payment basis.</p>	Participants from abroad :	US \$ 125	Industry/Research Organizations :	Rs. 2500	Academic Institutions :		a) Faculty :	Rs. 2000	b) Ph.D. Scholar :	Rs. 1500	c) UG/PG Student :	Rs. 1000
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b) Ph.D. Scholar :	Rs. 1500												
c) UG/PG Student :	Rs. 1000												

The Faculty



Dr. Jong-Min Kim is currently working as Full Professor of Statistics Division of Science and Mathematics University of Minnesota-Morris, Minnesota, United States of America. He received his PhD (Statistics) in 2002 from Department of Statistics, Oklahoma State University, Stillwater, Oklahoma, USA (Minor: Mathematics). He worked as Research Fellow at SAMSI -The Statistical and Applied Mathematical Sciences Institute (NSF, Duke, NCSU and UNC). He received Morris Faculty Distinguished Research Award. His research involves Statistical Genetics, Cluster Analysis, Big Data Analytics, Text Mining for Patent Data, Copula Directional Dependence, Cryptocurrency Data Analysis. He has published numbers of research papers in journals of international repute and supervised many PhD theses. He is editor & reviewer of several peer reviewed journals. Some of his important research publications in the field of Copula Directional Dependence and Big Data Analytics are listed on

<https://personal.morris.umn.edu/~jongmink/>



Dr. Gajendra K. Vishwakarma is currently working as an Associate Professor in the Department of Mathematics & Computing, Indian Institute of Technology (Indian School of Mines) Dhanbad, India. He obtained his PhD (Statistics) in 2007 from Vikram University Ujjain, India. He worked in both theoretical as well as applied statistics and

has several years of academic and industrial research experience. He is recipient of SIRE Fellowship Govt of India. He has published numbers of research papers in web of science listed journals and supervised 13 PhD theses. Further details about his academic and research credentials can be seen on

https://www.iitism.ac.in/index.php/Departments/faculties_apmat

Course registration fee can be paid either by NEFT preferably (Account holder name: The Registrar, Indian Institute of Technology (ISM) Dhanbad: Account No. 0986101009746; IFSC Code: CNRB0000986; Bank: CANARA BANK; Branch Name: Saraidhela Dhanbad) or by sending a demand draft in favour of "Registrar, IIT(ISM) Dhanbad" payable at Dhanbad – 826004 on or before November 30, 2023. The course fee is non-refundable. For further clarification, please contact the course co-ordinator.

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Course ID: 191058K02

Number of Credits: 02
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Course Co-ordinator

Dr. Gajendra K. Vishwakarma

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





REGISTRATION FORM

Big Data Analysis through Copula [Course ID: 191058K02]

(December 11-16, 2023)

(Send the soft copy of this form to course coordinator through e-mail, word file available on the website)

1. GIAN Registration/Application Number: _____
 2. Full Name: _____
 3. Date of Birth: _____ Category (Gen/OBC/SC/ST) _____
 4. Participation type (Industry/Academic/Student): _____
 5. Qualification/Degree Programme: _____
 6. Organization: _____
 7. Address: _____

 8. E-mail ID: _____ Mobile No.: _____
 9. Fee Detail: Payable to "Registrar, IIT(ISM) Dhanbad", CANARA BANK, Saraidhela, Dhanbad
 - i) Transaction No. (e-transfer/RTGS/NEFT): _____ Date: _____ Amount: _____
 - ii) Demand Draft No. (If paid by Demand Draft): _____ Date: _____ Amount: _____
 10. Accommodation Required: Yes/No: _____ in Hostel/Guest House _____
(Hostel will be provided as per institute norms, it might be free or with nominal charges, however guest house charges will be Rs 600/- plus GST per day on sharing basis.)
- Place : _____
- Date : _____ Signature of the Applicant: _____

Paste your soft copy of recent photograph

Welcome to

Department of Mathematics & Computing, Indian Institute of Technology (ISM) Dhanbad, India