Anand Deo

PHONE:	+65 91289376, +91 9821325517
EMAIL:	deo.anand.a@gmail.com
WEB-PAGE:	https://sites.google.com/view/anands-webpage/home
LinkedIn:	https://www.linkedin.com/in/anand-deo-operationsresearch/

WORK EXPERIENCE

Postdoctoral Researcher: Singapore University of Technology and Design,
SEP 2021-JAN 2023

EDUCATION

SEPTEMBER 2021	PhD - AREA OF RESEARCH: QUANTITATIVE RISK MANAGEMENT
THESIS TITLE:	"An Asymptotic Study of Risk in Financial Systems: Algorithms and Analysis"
	Tata Institute of Fundamental Research, Mumbai,
	Advisor: Dr. Sandeep JUNEJA
	Thesis Committee: Dr. Paul GLASSERMAN, Dr. Jayakrishnan NAIR.
NOVEMBER 2016	M.Sc. in COMPUTER SCIENCE
	Tata Institute of Fundamental Research, Mumbai
	Thesis: "Large Deviations in Portfolio Credit Risk"
	Advisor: Dr. Sandeep JUNEJA
JULY 2015	Bachleor of Engineering in ELECTRONICS,
	Mumbai University
	Average score - 82/100 *Highest in batch.*

RESEARCH INTERESTS

My research involves applying probabilistic and statistical techniques to solving problems in Operations Research and Quantitative Risk Management. Areas that I have worked on include

- Modelling tails of multivariate distributions and efficient estimation of tail risk measures
- Monte Carlo simulation in financial risk analysis
- Modelling and estimation of credit risk
- Extreme Value Theory and statistics of heavy tails
- Stochastic Optimisation, semi-parametric estimation

My current research direction involves applying state of the art statistical techniques to devising feasible (i.e. data efficient) algorithms for tail risk analytics. I am also interested in applying state of the art tools from machine learning to solving financial risk management problems.

AWARDS

- **Third Prize at INFORMS JFIG, 2021** for the paper "Achieving Efficiency in Black-box Simulation of Distribution Tails".
- **Best Paper Award at the CRISIL Doctoral Symposium, 2017** for the paper "Credit Risk: Simple Closed Form Approximate Maximum Likelihood Estimator".

Papers published in or under revision at journals

Credit Risk: Simple Closed Form Approximate Maximum Likelihood Estimator - Anand Deo and Sandeep Juneja. Operations Research, 2021

Achieving Efficiency in Black-box Simulation of Distribution Tails with Self-structuring Importance Samplers (with Karthyek Murthy, Singapore University of Technology and Design) - Under Revision at Operations Research

City-Scale Agent-Based Simulators for the Study of Non-Pharmaceutical Interventions in the Context of the COVID-19 Epidemic (with TIFR and IISc Covid Simulation Teams) - Journal of the Indian Institute of Science, 2020

Publications at Conferences with Proceedings

Overcoming the Sample Complexity Barrier in Risk Analytics with De-biased Learning (with Karthyek Murthy and Arjun Ramachandra) Analytics for X, 2022

Combining Retrospective Approximation with Importance Sampling for Optimising Conditional Value at Risk (Invited Paper, with Karthyek Murthy and Tirtho Sarker) Winter Simulation Conference, 2022

Optimizing tail risks using an importance sampling based extrapolation for heavy-tailed objectives (with Karthyek Murthy, Singapore University of Technology and Design) - Control and Decesion Conference, 2020.

Efficient Black Box Importance Sampling for VaR and CVaR estimation (with Karthyek Murthy, Singapore University of Technology and Design) - Winter Simulation Conference 2021

Limiting distributional fixed points in systemic risk graph models (Invited Paper, with Sandeep Juneja) Winter Simulation Conference, 2019.

Working Papers

A targeted scheme for model error correction in estimation of extreme risks (with Karthyek Murthy and Arjun Ramachandra Singapore University of Technology and Design) - Extended Abstract available on request

Data-efficient CVaR Optimisation in presence of heavy tails (jointly with Karthyek Murthy)

Selected Presentations

1) Departmental Seminars/Symposia

- CRISIL Doctoral Symposium, 2017
- Indian Institute of Technology, Mumbai, 2021
- Singapore University of Technology and Design, 2019
- STCS Symposium, Tata Institute of Fundamental Research, 2020, 2021
- Indian Institute of Management, Bangalore 2022

2) At specialised workshops

- Workshop on Applied Probability, March 31- April 2, 2017, TIFR Mumbai (Joint Talk with Sandeep Juneja)
- Lectures on Probability and Stochastic Processes XII Indian Statistical Institute, Kolkata December 15 - 19, 2017, Workshop on Learning Theory, TIFR, Mumbai, January 2 -6, 2019. (Poster presentation).
- Advances in Applied Probability, Bangalore 2019 (Poster)
- RE-SIM, 2021 (Poster)

3) Selected talks at conferences without proceedings

- INFORMS Annual Meeting, 2018, 2020, 2021 (Invited Speaker)
- INFORMS APS, Brisbane Australia, 2019 (Invited Speaker)
- Winter Simulation Conference, 2019
- MCM 2019, Sydney (Invited Speaker)
- ICC-Opt, 2022
- Analytics for X, 2022
- Winter Simulation Conference, 2022
- POMS-HK, 2023 (Invited Speaker)

Teaching

At TIFR: Real Analysis (Aug. 2016), Advanced Probability (Jan. 2018), Stochastic Processes (Aug. 2019). In addition, I have given short series of lectures on specialised topics such as large deviations theory, extreme value theory and stochastic control.

At SUTD: Stochastic Simulation (Sep. 2021), Statistical and Machine Learning (Jan. 2022), The Analytics Edge (May 2022).

Service

I have reviewed papers for the following journals and conferences: Stochastic Systems, INFORMS Journal of Computing, ACM-TOMACS ,Control Systems Letters, Journal of Optimization Theory and Applications, Winter Simulation Conference.

Other

- Co-organizer for workshop on learning theory, held at the Tata Institute of Fundamental research, Mumbai, form January 2-6, 2019.

Computer Skills

I have knowledge of and have used the following softwares in my various projects: C, C++, Matlab, LaTeX, R, Python.