Ankan Mitra

Curriculum Vitae

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Education

08/2018 – Present	**Doctor of Philosophy**, *Department of Industrial Engineering, Arizona State University, Tempe, AZ, USA (expected Summer 2023).* GPA: 3.98/4 (till Spring 2021)
08/2018 – 12/2020	**Master of Science**, *Department of Industrial Engineering, Arizona State University, Tempe, AZ, USA.* GPA: 3.9/4
08/2014 – 07/2018	**Bachelor of Engineering**, *Department of Production Engineering, Jadavpur University, Kolkata, WB, INDIA.* GPA: 8.96/10 (First Class with Honours) Rank in class: 1 in 38 Thesis: A hybrid multi-criteria decision-making model for optimal coal blending

Research Interest

Combinatorial Algorithms, Mixed Integer Linear Programming, Mixed Integer Quadratic Constrained Programming, Convex Optimization

Research and Work Experience

05/2019 – Present	**Graduate Researcher**
05/2019 – Present	*Department of Industrial Engineering, Arizona State University, USA.* Topic: Large scale optimization of network models using combinatorial algorithms. Advisor: Dr. Jorge Sefair
05/2017 – 07/2017	**Summer Research Intern** *Non-oxide Ceramics and Composites Division, CSIR - Central Glass and Ceramic Research Institute, INDIA.* Project: Study of machinability of sintered alumina and analysis using Grey-Fuzzy logic. Advisor: Dr. Dipayan Sanyal
08/2015 – 07/2018	**Undergraduate Researcher**
08/2016 – 07/2018	*Department of Production Engineering, Jadavpur University, INDIA.* Topic: Modelling and optimization of advanced machining processes, applications of decision making techniques. Advisor: Dr. Shankar Chakraborty
08/2015 – 07/2018	*Department of Mechanical Engineering, Netaji Subhas Engineering College, INDIA.* Topic: Optimization of longitudinal fins considering all non-linearity effects. Advisor: Dr. Debasis Barman

06/2016 – 07/2016 **Industrial Trainee**

Brake Block Manufacturing Plant, Wabtec Texmaco Rail Private Ltd., INDIA

Hands-on experience of online and offline inspection techniques and assembly operation of products

Research projects

1 **Optimal sensor locations in a wireless sensor network (05/2019 – present)**

Use of branch-and-cut method along with node heuristics to find optimal sensor locations in a WSN. Also developed novel mathematical programming models (MILP) for solving the problem in presence of physical obstacles.

2 **Optimal sampling points in a real-world sewage network (05/2020 – present)**

Developed mixed-integer linear programming model (MILP) based on network flows to find optimal sampling locations to capture information flowing through the network. Also devised heuristics to act as a warm-start and developed models for several scenarios such as "flow covering" and "disjoint flow".

3 **Optimal subset of wildlife/natural reserve patches to maximize the compactness of the selected reserve (08/2020 – present)**

Developed mixed-integer linear programming model for a mixed-integer non-linear program (MINLP), with very high level of precision. Devised heuristics to speed up the branch-and-cut process. Linearized a non-linear compactness metric.

4 **Maximum capacity path interdiction problem (05/2020 – 08/2021)**

Collaborative work with Dr. Javad Tayyebi, to develop a polynomial-time algorithm and it's rigorous proof of correctness, for the maximum capacity path interdiction problem with continuous interdiction costs.

5 **Interdiction of service-agent transport-agent task scheduling problem (05/2021 – present)**

Developing an improved mathematical model for the service agent transport agent task scheduling problem.

Publications

Book Chapters

1 **A. Mitra**, S. Chakraborty, "Parametric optimization of laser beam machining processes using shuffled frog leaping algorithm", in "Focus on Swarm Intelligence Research and Applications", (eds. B. Benhala et. al.), Nova Science Publishers Inc, ISBN: 978-1-53612-452-1, pp. 21–44, (2017)

Conference

1 **A. Mitra**, R. Pan, "Early Prediction of Lithium-Ion Battery Cycle Life by Machine Learning Methods", in The 68th Annual Reliability and Maintainability Symposium (RAMS) 2022 Conference, (2022) *Final Review - Accepted*

Journal Articles

5 J. Tayyebi, **A. Mitra**, J. Sefair, "Maximum capacity path interdiction problem", European Journal of Operational Research, (2021) *Under Review*

4 **A. Mitra**, S. Chakraborty, "A hybrid multi-criteria decision making model for optimal coal blending", Journal of Modelling in Management, Vol. 14 (2), pp. 339–359, (2019)

3   **A. Mitra**, S. Chakraborty, "A multivariate quality loss function approach for optimization of spinning processes", Journal of The Institution of Engineers (India): Series E, Vol. 99 (1), pp. 101–109, (2018)

2   **A. Mitra**, S. Chakraborty, "Parametric optimization of abrasive water-jet machining processes using grey wolf optimizer", Materials and Manufacturing Processes, Vol. 33 (13), pp. 1471–1482, (2018)

1   S. Chakraborty, K.R. Ramakrishnan, **A. Mitra**, "A multi-criteria decision support model for optimal cotton fibre blending", The Journal of the Textile Institute, Vol. 109 (11), pp. 1482–1492, (2018)

Talks and Presentations

Nov 2020   *Presented a talk on **"Maximum Capacity Path Interdiction Problem"**, in INFORMS Annual Meeting 2020.*

Teaching Experience

08/2018 – 05/2020   **Graduate Teaching Assistant**

2018 – 2020   *IEE 380 - Probability and Statistics for Engineering Problem Solving*

     Fall 2019, Spring 2020 - Instructor: Dr. Michael Clough

     Fall 2018, Spring 2019 - Instructor: Dr. Linda Chattin

Fall 2019   **Teaching Internship**

     IEE 620 - Optimization I (Instructor: Dr. Jorge Sefair)

04/2015 – 03/2017   **Private Tutor**

     Taught Physics, Chemistry and Mathematics to high-school students.

Awards and Honours

Summer '20, '21   **CIDSE Doctoral Fellowship**

     Awarded by School of Computing, Informatics and Desicion Systems Engineering

2018 – 2019   **CIDSE Doctoral Fellowship**

     Awarded by School of Computing, Informatics and Desicion Systems Engineering

12/2018   **University Medal**

     Awarded by Jadavpur University(for standing first in order of merit in Production engineering, at the Bachelor of Engineering Examination, 2018)

01/2018   **Meera Rani Mitra Memorial Award**

     Awarded by Alumni Association NCE Bengal and Jadavpur University

     (for securing highest marks in Production Engineering department, in the third year university examination held in 2017)

12/2016   **Indu Bhushan Putatunda and Shanti Sudha Putatunda Memorial Award**

     Awarded by Alumni Association NCE Bengal and Jadavpur University

     (for securing highest marks in Production Engineering department, in the second year university examination held in 2016)

05/2014   **Certificate of Merit**

     Awarded by Kendriya Vidyalaya Sangathan

     (for securing position in the top 1.5% of K.V.S. students in the All India Senior School Certificate Examination 2014, conducted by CBSE)

Technical Skills

Programming	PYTHON, MATLAB, LINDO, AMPL
Optimization	GUROBI, CPLEX
Design & Modeling	AUTOCAD
Web Development	HTML, CSS
Statistical Packages	MINITAB, MS EXCEL
Representation	LaTeX, MS OFFICE, ORIGIN PRO

Relevant Graduate Coursework

Core Courses	Optimization I (IEE 620), Optimization II (IEE 622)
Electives	Network Flows and Algorithms (IEE 598), Graph Theory I (MAT 516), Foundation of Algorithms (CSE 551), Operations Research in Healthcare (IEE 526), Bio-inspired Algorithms in AI and Optimization (IEE 598), Modeling with Game Theory (AML 591), Combinatorial Algorithms and Intractability (CSE 550), Statistical Learning for Data Mining (IEE 520), Computational Statistics (STP 540), Large Scale Optimization (EEE 598)*

* -To be completed by Fall 2021

Extra-curricular activities

Hobbies	Singing, Painting, Table Tennis, Reading novels
08/2014 – 07/2018	Active participant in annual technical fest, SRIJAN (Jadavpur University)

Social Services

Volunteer and fund raiser at Help Age India (a non-profit NGO) for 2 years.