Dr. Tanushree Pandit, Ph.D.

tanushreepandit91@gmail.com / tpandit@cusat.ac.in ☎ 8960419388
https://iqac.cusat.ac.in/Web/profile_view/413/Dr.TANUSHREEPANDIT

Personal Details

- Date of Birth: 13^{th} July, 1991
- Gender: Female
- Marrital Status: Married
- Nationality: Indian

Research Interest

My main research interest lies in developing **algorithms** and their **convergence and complexity analysis**. I have worked on the **Simple Bilevel Programming** (SBP) problem and its extensions so far. I have developed several algorithms for this class of problems and successfully discussed their convergence analysis. Currently I am working on algorithms for (SBP) problem and their complexity analysis which has not been done so far as per my knowledge and been successful to do so. I am very much interested to extend my research to **Bilevel Programming** (BP) and explore how I can push my ideas from (SBP) to (BP) problem. Along with this I am also interested in the **optimality conditions** and **error bounds** for convex optimization problem which is also associated with the algorithms in some cases. My work mostly consists of **convex optimization** problem be it smooth or non-smooth. Recently I have been interested in **prediction models** and the algorithms that can be used for those models.

Employment History

2021 – · · · · **Assistant Professor,** Deapartment of Mathematics, Cochin University of Science and Technology.

2019 – 2020 **Project Scientist,** with Dr. Ketan Rajawat in the Department of Electrical Engineering at IIT Kanpur.

Education

2013 – 2019 **Ph.D., Indian Institute of Technology Kanpur** in Mathematics with 9.25 CPI in Ph.D. Course work.
Thesis title: *Simple Bilevel Programming Problem and Extensions: Theory and Algorithms*

2011 – 2013 **M.Sc. Mathematics, Indian Institute of Technology Kanpur** with 8.5 CPI.

2008 – 2011 **B.Sc. Mathematics, Calcutta University** with 71.6% marks.

Research Publications

- Simple bilevel programming and extensions; Stephan Dempe, Nguyen Dinh, Joydeep Dutta and Tanushree Pandit. Mathematical Programming, Springer (2020).
DOI: https://link.springer.com/article/10.1007/s10107-020-01509-x

Research Publications (continued)

- Algorithmic schemes for non-smooth simple bilevel programming problem and simple MPEC problem; Stephan Dempe, Nguyen Dinh, Joydeep Dutta and Tanushree Pandit. Optimization, Taylor and Francis (2023).
  DOI: https://doi.org/10.1080/02331934.2023.2230991
- About the links between equilibrium problems and variational inequalities; Didier Aussel, Joydeep Dutta and Tanushree Pandit: Mathematical programming and game theory, 115–130, Indian Stat. Inst. Ser., Springer, Singapore, 2018.
  DOI: https://doi.org/10.1007/978-981-13-3059-9_6
- Algorithms for simple bilevel programming; Joydeep Dutta and Tanushree Pandit. A chapter in an edited volume titled "Bilevel Optimization: Advances and Next Challenges" by Springer (Pages 253-291).
  DOI: https://www.springer.com/gp/book/9783030521189

Research Preprints

- A simple algorithm for the simple bilevel programming (SBP) problem; Tanushree Pandit, Joydeep Dutta, K. S. Mallikarjuna Rao: Preprint, 2024.
- Complexity Analysis for the Simple Bilevel Programming (SBP) Problem: Tanushree Pandit, Ketan Rajawat: Preprint, 2024.
- Revisiting error bounds for convex inequalities; Tanushree Pandit and Joydeep Dutta (Under preparation).

Conference Talks

- International Conference on Recent Advances in Optimization Theory and Applications organized at Delhi University: 30-31 January, 2016. Title of the talk: “An algorithm for Bi-level convex optimization problem”.
- International Symposium on Operations Research and Game Theory: Modelling and Computation organized at Indian Statistical Institute Delhi: 9-11 January, 2018, “About the links between equilibrium problem and variational inequalities”.

Other Talks

- Invited talk at St. Thomas College, Trissur, India: 7^{th} January, 2023. Title of the talk: “Introduction to Gradient Optimization in AI”.
- Indian Institute of Technology Kanpur, India: 23-24 January, 2016; Open House Colloquium. Title of the talk: “An algorithm for Simple Bilevel Programming problem”.
- Indian Institute of Technology Kanpur, India: 27-28 January, 2018; Open House Colloquium. Title of the talk: “About the links between equilibrium problem and variational inequalities”.

Academic Achievements

- Secured All India Rank 04 in GATE (Graduate Aptitude Test in Engineering) in Mathematics, 2013.
- Secured JRF (Junior Research Fellowship) with All India Rank 36 in NET (National Eligibility Test) in the subject Mathematical Sciences under CSIR-UGC test, 2013.

Academic Achievements (continued)

- Selected for the NBHM (National Board for Higher Mathematics) postgraduate scholarship in mathematics in 2012.
- Achieved the certificate of merit for academic excellence in M.Sc. at IIT Kanpur for the year 2011-2012.
- Secured All India Rank 09 in JAM (Joint Admission Test for Masters) in Mathematics, 2011.
- Obtained National Merit Scholarship for the result in 12th standard.

Conferences/ Workshops Attended

- GIAN (Global Initiative of Academic Network) course on "Stochastic Programming and Applications" taken by John R Birge and Prof. Joydeep Dutta: March, 2018.
- International Symposium on Operations Research and Game Theory: Modelling and Computation organized at Indian Statistical Institute Delhi: January, 2018.
- "International Workshop on Convex Analysis and Optimization (IWCAO)" held at Aligarh Muslim University; India: November, 2017.
- GIAN(Global Initiative of Academic Network) course on "Optimization: Applications, Algorithms and Computations" taken by Dr. Sven Leyffer and got excellent grade: September, 2016.
- "Advanced Instructional School on Optimization" held at Indian Institute of Technology, Bombay; India: May, 2016.
- "Mini Symposium on Computation and Optimization in the Sciences and Engineering" held at Indian Institute of Technology, Kanpur; India: February, 2016.
- International Conference on Recent Advances in Optimization Theory and Applications organized at Delhi University: January, 2016.
- "Summer Program in Mathematics (SPIM)" in Harish Chandra Research Institute, Allahabad; India : July, 2012.

Teaching Experiences

Taught the following courses at Cochin University of Science and Technology for the MSc and Integrated MSc students.

- Linear Algebra
- Complex analysis
- Calculus
- Partial differential equation
- Mathematical Methods
- Ordinary differential equation.
- Basics of Python and SageMath

Teaching assistant for the following courses at IIT Kanpur.

- Complex analysis
- Partial differential equation
- Abstract Algebra
- Linear Algebra
- Ordinary differential equation.

Outreach Experiences

Teaching assistant for the following NPTEL (National Programme on Technology Enhanced Learning) online certification courses.

- Convex Optimization
- Basic Calculus for Engineers, Scientists and Economists
- Calculus of One Real Variable
- Calculus of Several Real Variables
- Linear Algebra

Extra-Curricular Activities

- Worked as Mentor in PG Team 2015-16 of Counselling Service, IIT Kanpur.
- Successfully completed the Tour de force (Marathon of 5km) in the Intra-IIT Marathon, 2013.
- Held the post of Mess committee member of Hall of residence of GH-2, IIT Kanpur in 2013.
- Participated in Guinness world record of solving Rubik's Cube organized in Techkriti, IIT Kanpur held in 2013.

Skills

Languages	Strong reading, writing and speaking competencies for English and Bengali. Speaking competencies for Hindi and Tamil.
Coding	Python, C, Matlab, AMPL. LaTeX.