

# GOGULAPATI SREEDURGA

Office 4.38, School of Informatics, University of Edinburgh  
+447930144320  $\diamond$  sgogulap@ed.ac.uk

## SUMMARY

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I am an inquisitive and dedicated researcher presently serving as a DeepMind Academic Fellow at the University of Edinburgh. In my previous role, I was a Prime Minister Research Fellow (Direct PhD student) at the Indian Institute of Science. Successfully defending my PhD thesis, titled ‘*Exploring Welfare Maximization and Fairness in Participatory Budgeting*’, I delved into the challenges of preference aggregation for budget allocation and proposed various algorithms and axioms in that context.

My expertise lies at the intersection of computer science and economics. Specifically, my research focuses on computational social choice, game theory, and algorithm design. I am also deeply intrigued by the potential applications of deep learning within game theoretic frameworks.

## EMPLOYMENT

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<b>DeepMind Academic Fellow</b> School of Informatics, University of Edinburgh	<i>Present</i>
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## EDUCATION

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<b>Indian Institute of Science, Bangalore</b> Direct Ph.D. (PMRF Fellow), Game Theory Lab, Department of Computer Science and Automation.	<i>August 2018 - July 2023</i> Overall CGPA: 8.2
<b>Indian Institute of Information Technology, Jabalpur</b> B.Tech (Gold Medalist), Computer Science and Engineering.	<i>July 2014 - July 2018</i> Overall CGPA: 9.2
<b>FIITJEE, Vijayawada</b> Class 12th.	<i>June 2012 - June 2014</i> Overall Percentage: 96.6%
<b>Nalanda Vidya Niketan, Vijayawada</b> Class 10th.	<i>May 2011 - May 2012</i> Overall CGPA: 9.8

## ACADEMIC ACHIEVEMENTS AND ROLES

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Selected for the DeepMind Fellowship

Acted as a reviewer in several prestigious conferences (IJCAI, AAMAS, WINE, SOSA etc.)

Selected for the Prime Minister Research Fellowship (PMRF) and got an admission into Direct PhD immediately after my bachelors, funded by this fellowship

Gold Medalist (Topper of all disciplines) in B.Tech.

Best Poster Award at ACM Summer School on Algorithmic Game Theory at IITGN, 2019

Selected for the prestigious JENESYS program 2016 or youth exchange between India and Japan.

Received Certificate of Appreciation and a merit scholarship for Academic Excellence from Govt. of India in the years 2015,16,17 and 18.

## RESEARCH INTERNSHIPS

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<b>University of Warwick, United Kingdom</b> <i>Research Visit</i> Collaborating with Prof. Markus Brill on a project on participatory budgeting.	Jan 2023 - Apr 2023
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Explored collaboration in participatory budgeting projects with the lab of Prof. Ulle Endriss.

Internship in Natural Language Processing under Prof. Manish Shrivastava.

## PUBLICATIONS

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- *Hybrid Participatory Budgeting: Divisible, Indivisible, and Beyond.*  
Sreedurga G, AAMAS-2024  
I propose a model that encompasses divisible PB, indivisible PB, and many other variants in social choice as special cases. I proposed several objectives, algorithms, and proved their superior performance.
- *Participatory Budgeting with Multiple Degrees of Projects and Ranged Approval Votes.*  
Sreedurga G, IJCAI-2023.
- *Indivisible Participatory Budgeting with Multiple Degrees of Sophistication of Projects.*  
Sreedurga G, AAMAS-2023.  
I propose a model where every project has a set of permissible costs, and each agent may report lower and upper bounds on the cost she thinks the project deserves. I propose four utility notions and study the computational and axiomatic properties of the utilitarian outcomes.
- *Individual-Fair and Group-Fair Social Choice Rules under Single-Peaked Preferences.*  
Sreedurga G, Sadhukhan S, Roy S, Narahari Y, AAMAS-2023.  
We consider the scenarios where agents are partitioned into groups and define three fairness notions for divisible PB under single-peaked preferences that envelop many existing notions for the setting. We give complete characterization of unanimous and strategy-proof fair rules.
- *The Rule-Tool-User Nexus in Digital Collective Decisions.*  
Terzopoulou Z, Keijzer M A, Sreedurga G, Heitzig J, AAMAS-2023.  
We formalize all the facets of the interaction between the agents, the voting rule, and the voting platform. We also identify several open research directions and indicate the interdisciplinary research methodologies to resolve various problems on this front.
- *Maxmin Participatory Budgeting.*  
Sreedurga G, Bhardwaj M R, Narahari Y, IJCAI-2022, Pg 489-495.  
We propose a novel fair approval-based participatory budgeting rule that achieves diversity and gave several computational and axiomatic results.
- *Participatory Budgeting: Fairness and Welfare Maximization.*  
Sreedurga G, EUMAS-2022, Pg 439-443.  
I summarize the axes on the which PB can be classified, and point out some problems solved in PB for different contexts.
- *Indivisible Participatory Budgeting under Weakly Ordinal Preferences.*  
Sreedurga G, Narahari Y, under review.  
We proposed three families of rules for fair indivisible PB under weak ordinal preferences. We proved that each of these families satisfies compelling computational and axiomatic properties.
- *Welfare-Maximizing Median Rules.*  
Sreedurga G, Sadhukhan S, Roy S, in progress.

- *Divisible Participatory Budgeting with Projects having Range of Costs.*  
Sreedurga G, in progress.
- *Random Object Assignment.*  
Sreedurga G, Sadhukhan S, Roy S, in progress.

## TEACHING EXPERIENCE

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### Dayanand Sagar University, Bangalore

Jan 2023 - June 2023

*Visiting Faculty*

Conducting a course on Algorithmic Game Theory and its Applications.

### Dayanand Sagar University, Bangalore

Apr 22nd - May 5th 2022

*Visiting Faculty*

Conducted a workshop on Research Writing for B.Tech. students at DSU.

### Dayanand Sagar University, Bangalore

Nov 9th - Nov 11th 2021

*Visiting Faculty*

Conducted a workshop on Basics of Game Theory for B.Tech. students at DSU.

### IISc Bangalore

March - June 2021

*Teaching Assistant*

TA for two courses: Data Structures and Algorithms and Game Theory and Mechanism Design in CSA department, IISc.

### Dayanand Sagar University, Bangalore

Feb 6th - Feb 20th 2021

*Visiting Faculty*

Conducted a workshop on Algorithmic Game Theory for B.Tech. and M.Tech. students at DSU.

### IISc Bangalore

Jan - July 2020

*Teaching Assistant*

TA for the Game Theory and Mechanism Design course in CSA department, IISc.

### MSRIT

Jan 2020

*Speaker*

Took lectures in the Faculty Development Program (FDP) on the 'Applications of optimization techniques and number theory in engineering sciences' for the faculty of various institutes in Karnataka.

### ICTS - TIFR

May 2020

*Speaker*

Taught a course on Game Theory and Mechanism Design in the ICTS workshop on Dynamics of Complex Systems.

### IIT Delhi

July 2015

*Trainee*

Secured All India 13th rank in NCAT Olympiad conducted by IITs and IISc together and participated in a workshop in IITD.

## EXTRA-CURRICULARS

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Completed course equivalent to B.A. in Sanskrit with distinction (87%) in 2023.

Completed Diploma in light music from Telugu University with distinction (83%) in 2018.

Secured All India 13th rank in National Creativity and Aptitude Test conducted by few IITs and IISc and was selected for a one week workshop on Creativity in IIT Delhi.

Won a Gold medal in AP Statewide Eduranet Olympiad for Communication and Presentation Skills and a Silver medal for Analytical and Problem Solving Skills in the year 2011.

Won a Silver medal in AP Statewide Eduranet Olympiad for Communication and Presentation Skills and a Bronze medal for Leadership and Social skills in the year 2012.

Served as the coordinator of music club at IIIT Jabalpur from August 2016 - August 2017 and conducted various events at cultural and Inter IIIT Techno-cultural fests.

Served as an Assistant Coordinator (Aug 2016-17) and Student Guide (Aug 2015-16) in the student counselling committee in IIITDMJ.

Served as a voluntary teacher (2014-18) in the Jagriti Organisation that teaches the under-privileged kids from slums.