

# Anagha Satish

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## EDUCATION

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- **Harvard University** Aug 2025 -  
Cambridge, MA  
*PhD in Computer Science*
  - Advisor: Milind Tambe
- **California Institute of Technology** Sep 2021 - Jun 2025  
Pasadena, CA  
*Majors: Computer Science, Minor: Information and Data Science*
  - Selected Coursework: Networks and Economics, Markov Chains and Discrete Stochastic Processes, ML and Data Mining, Large Language and Vision Models, Inverse Problems and Data Assimilation, Convex Analysis, Game Theory, Microeconomic Theory, American Electoral Behavior

## EXPERIENCE

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- **Franca Hoffmann Group, Caltech** Jun 2024 - Jan 2025  
*Advisors: Prof. Franca Hoffmann, Dr. Ricardo Baptista*
  - Developed a hybrid optimization algorithm incorporating Consensus Based Optimization (CBO) and gradient-based methods
  - Conducted analysis on ML and non-ML benchmark problems to demonstrate improved learning efficiency
- **Adam Wierman Group, Caltech** Mar 2024 - Aug 2024  
*Advisor: Prof. Adam Wierman*
  - Developed two novel "common ground" optimization algorithms to realistically minimize polarization on a social network.
  - Demonstrated improvement over traditional algorithms on both synthetic and real-world networks.
- **Andrew Stuart Group, Caltech** Dec 2023 - Aug 2024  
*Advisors: Prof. Andrew Stuart, Dr. Eviatar Bach*
  - Implemented novel algorithm to integrate dynamical and ML ensembles for data assimilation using the framework of the Multi-Model Ensemble Kalman Filter
  - Demonstrated improvement in filtering performance when incorporating ML ensembles
- **NASA Jet Propulsion Laboratory** Jun 2023 - Sep 2023  
*Supervisors: Dr. Brian Bue, Jake Lee*
  - Worked with JPL Machine Learning and Instrument Autonomy team and Carbon Mapper nonprofit on methane plume detection project
  - Led code development for alternative auxiliary inputs and image enhancement
  - Resulted in 30% increase in F1 Score. Work produced new state of the art model
- **Climate Modeling Alliance (CliMA), Caltech** Jun 2022 - Aug 2022  
*Advisors: Prof. Tapio Schneider, Dr. Oliver Dunbar*
  - Implemented covariance localization and multiplicative inflation extensions for CliMA's Ensemble Kalman Inversion (EKI) methodology
  - Demonstrated improved performance on chaotic Lorenz96 and Lorenz63 systems

## AWARDS

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- 2nd Best Paper Award, *IEEE MIT Undergraduate Research Technology Conference* 2024
- Kirk and Marjory Dawson Family Summer Undergraduate Research Fellowship 2024
- Michael and Edwenna Werner Summer Undergraduate Research Fellowship 2023
- Class of '36 Summer Undergraduate Research Fellowship 2022

## PRESENTATIONS

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- **NeurIPS Optimization for Machine Learning Workshop**, Dec 2024. *Consensus Based Optimization Accelerates Gradient Descent* (Poster)
- **Caltech SURF Seminar Day**, Oct 2024. *Consensus Based Optimization Accelerates Gradient Descent* (Oral)
- **MIT Undergraduate Research Technology Conference**, Oct 2024. *Finding Common Ground: A Two-Opinion Approach to Reducing Polarization in Networks* (Oral)
- **Caltech CMS + IST Meeting of the Minds**, May 2024. *Finding Common Ground: A Two-Opinion Approach to Reducing Polarization in Networks* (Poster)
- **American Geophysical Union Fall Meeting**, Dec 2023. *Improving Deep Learning Methods for Robust Methane Plume Detection using Alternative Input Representations* (Poster)
- **Caltech SURF Seminar Day**, Aug 2024. *Extending Ensemble Kalman Methods for Climate Parameter Learning* (Poster)
- **California Geophysical Fluid Dynamics Conference**, Aug 2024. *Extending Ensemble Kalman Methods for Climate Parameter Learning* (Poster)

## PUBLICATIONS

C=CONFERENCE, J=JOURNAL, S=IN SUBMISSION

- [S.1] Brian D. Bue, Jake H. Lee, Andrew K. Thorpe, Philip G. Brodrick, Daniel Cusworth, Alana Ayasse, Vassiliki Mancoridis, **Anagha Satish**, Shujun Xiong, Riley Duren. (2025). **Towards Operational Automated Greenhouse Gas Plume Detection**. Manuscript submitted for publication in *Remote Sensing of Environment*.
- [C.1] Sulekha Kishore\* and **Anagha Satish\***. (2024). **Finding Common Ground: A Two-Opinion Approach to Reducing Polarization in Networks**. In *Proceedings of the 2024 IEEE MIT Undergraduate Research Technology Conference (URTC)*, pp. 1–6. IEEE. DOI: 10.1109/URTC65039.2024.10937624

## TEACHING

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- **Teaching Assistant — Caltech CS 144: Networks: Structure and Economics** Jan 2025 – Mar 2025  
*Under Prof. Eric Mazumdar*
  - Graduate-level course on Network Economics
  - Held office hours and graded problem sets
  - Presented introductory lecture on game theory
- **Teaching Assistant — Caltech CS 143: Networks: Algorithms and Architecture** Sep 2024 – Dec 2024  
*Under Prof. Adam Wierman*
  - Graduate-level course covering topics in optimization, network architecture, online algorithms, and scheduling
  - Assisted with the first iteration of the course and helped develop problem sets and solutions
  - Held weekly office hours to assist students with problem sets
  - Developed and presented an introductory lecture on game theory
- **Teaching Assistant — Caltech CS 4: Fundamentals of Computer Programming** Jan 2024 – Mar 2024  
*Under Prof. Michael Vanier*
  - Undergraduate course on functional programming, taught in OCaml
  - Graded assignments and provided detailed feedback for student reworks

## LEADERSHIP

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- **Student Faculty Programs Ambassador** Aug 2023 - June 2025  
*Caltech Student Faculty Programs*
  - Academic year: Worked with Student and Faculty Programs (SFP) staff to share updates on student engagement. Hosted office hours to advise students on the SURF application.
  - Summer: Worked with Office of Student Engagement (OSE) staff to plan events for undergraduate summer researchers.
- **Admissions Ambassador** May 2022 - June 2025  
*Caltech Admissions*
  - Lead weekly campus tours for prospective/admitted students
  - Served as a Freshman Camp Counselor 2022 for admitted students
  - Modeled for admissions media, featured on the cover of pamphlets and the website

## INVITED TALKS

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- Caltech WiSTEM Engineering and Applied Sciences Symposium, Speaker *Aug 2024*
- Caltech WiSTEM Women in STEM Panel, Panelist *Aug 2022*