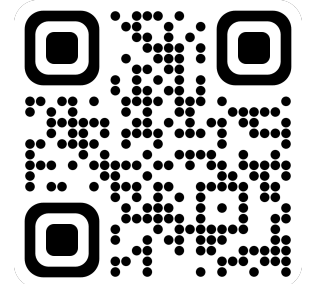


# Zeel B Patel

Date of Birth: 04 Aug 1996 (28 years old)  
Nationality: Indian  
Website: <https://patel-zeel.github.io/>

Email: [patel\\_zeel@iitgn.ac.in](mailto:patel_zeel@iitgn.ac.in)  
GitHub: <https://github.com/patel-zeel>



## EDUCATION

- **PhD in Computer Science**, *Jan 2020 - Present*  
Research Topic: Probabilistic Machine Learning for Environment Modeling and Sensor Placement.  
Advisor: [Nipun Batra](#)  
CPI: 9.7/10  
IIT Gandhinagar, Gujarat, India
- **M.Tech (Specialization: Smart Manufacturing)**, *Aug 2017 - May 2019*  
CGPA: 9.17/10  
IIITDM Kancheepuram, Chennai, India

## SELECTED AWARDS

[Microsoft Research India PhD Fellowship Award](#). Unrestricted grant of 10 lakh INR. 2024

## BOOK CONTRIBUTIONS

- **Probabilistic Machine Learning: Advanced Topics**: <https://probml.github.io/pml-book/book2.html>  
I co-authored Section 34.7 (Active learning) with Dr. Kevin Murphy
- **Code-First-ML**: <https://code-first-ml.github.io/>  
This book is a work-in-progress joint effort with my advisor and Prof. [Ashish Tendulkar](#) to pragmatically explain ML concepts with interactive codes and visualizations.

## SOFTWARE DEVELOPMENT EXPERIENCE

- **Google Summer of Code** *Jun 2022 - Sep 2022*  
Organization: Google  
Mentor: [Kevin P Murphy](#)  
Project: [Develop JAX examples and demos for an ML upcoming textbook and tightly integrate codebase with the book](#)  
GitHub repo: <https://github.com/probml/pyprobml>  
Final report: <https://patel-zeel.github.io/gsoc22>

## PUBLICATIONS ([GOOGLE SCHOLAR PROFILE](#))

### Selected Peer-reviewed articles

1. **Zeel B Patel**, Palak Purohit, Harsh Patel, Shivam Sahni, Nipun Batra  
[Accurate and Scalable Gaussian Processes for Fine-grained Air Quality Inference](#)  
AAAI 2022 (CORE A\* - 15% acceptance rate)  
GitHub repo: <https://github.com/patel-zeel/AAAI22>
2. Sachin Chauhan, **Zeel B Patel**, Sayan Ranu, Rijurekha Sen, Nipun Batra  
[Fine-Grained Spatio-Temporal Particulate Matter Dataset From Delhi For ML based Modeling](#)  
In NeurIPS 2023 Datasets and Benchmarks (CORE A\* - 32.7% acceptance rate)
3. Rishiraj Adhikary, **Zeel B Patel**, Tanmay Srivasatava, Nipun Batra, Mayank Singh, Udit Bhatia, Sarath Guttikunda  
[Vartalaap: What Drives #AirQuality Discussions: Politics, Pollution or Pseudo-science?](#)  
CSCW Journal 2021 (CORE A)  
GitHub repo: <https://github.com/rishi-a/Vartalaap>

4. Karm Patel, Rishiraj Adhikary, **Zeel B Patel**, Nipun Batra, Sarath Guttikunda  
*Samachar: News Media on Air Pollution in India*  
COMPASS 2022  
GitHub repo: <https://github.com/karm-patel/Samachar-News-media-on-air-pollution>

## Other Distinguished Work

1. **Zeel B Patel**, Rishabh Mondal, Shataxi Dubey, Suraj Jaiswal, Sarath Guttikunda, Nipun Batra  
*Space to Policy: Scalable Brick Kiln Detection and Automatic Compliance Monitoring with Geospatial Data*  
arXiv 2024

## Symposium, Workshop papers and Posters

1. Yash Bachwana, Khush Shah, Nitish Sharma, **Zeel B Patel**, Nipun Batra, Sarath Guttikunda  
*VayuBuddy: LLM-powered natural language interface for exploring and understanding air pollution data*  
Live Demo  
ACM COMPASS Posters 2024
2. Rishabh Mondal, Shataxi Dubey, Vannsh Jani, Shrimay Shah, Suraj Jaiswal, **Zeel B Patel**, Nipun Batra  
*Eye in the Sky: Detection and Compliance Monitoring of Brick Kilns using Satellite Imagery*  
ACM COMPASS Posters 2024
3. Aditi Agarwal, Suraj Jaiswal, Madhav Kanda, Dhruv Patel, Rishabh Mondal, Vannsh Jani, **Zeel B Patel**, Nipun Batra, Sarath Guttikunda  
*Towards Scalable Identification of Brick Kilns from Satellite Imagery with Active Learning*  
NeurIPS Workshop on Adaptive Experimental Design and Active Learning in the Real World 2023 (CORE A\*)
4. **Zeel B Patel**, Nipun Batra, Kevin Murphy  
*Uncertainty Disentanglement with Non-stationary Heteroscedastic Gaussian Processes for Active Learning*  
NeurIPS Workshop on Gaussian Processes, Spatiotemporal Modeling, and Decision-making Systems 2022 (CORE A\*)
5. Aadesh Desai, Eshan Gujarathi, Saagar Parikh, Sachin Yadav, **Zeel B Patel**, Nipun Batra  
*Deep Gaussian Processes for Air Quality Inference*  
Young Researchers' Symposium, CODS-COMAD 2023
6. Aadesh Desai, Gautam Vashishtha, **Zeel B Patel**, Nipun Batra  
*Challenges in Gaussian Processes for Non Intrusive Load Monitoring*  
NeurIPS Workshop on Gaussian Processes, Spatiotemporal Modeling, and Decision-making Systems 2022 (CORE A\*)
7. **Zeel B Patel**, Nipun Batra  
*Towards Active Air Quality Station Deployment*  
SubSetML Workshop, ICML 2021 (CORE A\*)
8. **Zeel B Patel\***, S Deepak Narayanan\*, Apoorv Agnihotri, Nipun Batra  
*Poster: A toolkit for spatial interpolation and sensor placement*  
ACM SenSys 2020 (CORE A\*)  
GitHub repo: <https://github.com/sustainability-lab/polire>
9. **Zeel B Patel**, Nipun Batra  
*Active Learning: A Visual Tour*  
3rd Workshop on Visualization for AI Explainability, IEEE VIS 2020 (CORE A)  
Weblink: <https://patel-zeel.github.io/active-learning-visualization/>

## AWARDS

---

### Awards

- Microsoft Research India PhD Award. Unrestricted grant of 1 million INR. 2024
- Outstanding Graduate Teaching Fellow award in Probabilistic Machine Learning course. Fall 2022

IIT Gandhinagar

### Registration grants

- NeurIPS 2022
  - GPSS 2022
  - AAAI 2022
  - ICML 2021
  - IEEE VIS 2020
- Helped advisor with
- Google PaliGemma Compute Grant 2024 (\$5000 credits in Google Cloud Platform)
  - Google Compute Grant 2021 (\$5000 credits in Google Cloud Platform)

## INVITED TALKS

---

### Google Global Air Quality Summit

13th Nov, 2024

Topic: AirChat: LLM-Powered Chatbot System to Democratize Urban Air Quality Information

App Demo: <https://sustainabilitylabiitgn-vayubuddy.hf.space>

Gurugram, India

### Air Sensors International Conference

26th Aug, 2022

Topic: Accurate and Scalable Gaussian Processes for Fine-grained Air Quality Inference

Organized by CSTEP, India and UC DAVIS

Bengaluru, India

## OPEN SOURCE LIBRARIES

---

**ASTRA:** <https://github.com/sustainability-lab/ASTRA>

"AI for Sustainability" Toolkit for Research and Analysis. We use this for research at our [lab](#)

**BIJAX:** <https://github.com/patel-zeel/bijax>

Bayesian Inference in JAX

**GPAX:** <https://github.com/patel-zeel/gpax>

Gaussian processes in JAX

**skgpytorch:** <https://github.com/patel-zeel/skgpytorch>

Scikit-learn like interface for GPyTorch

## SELECTED OPEN SOURCE CONTRIBUTIONS

---

**supervision (Roboflow):** <https://github.com/roboflow/supervision>

- Helped in supporting Oriented Bounding Boxes Object Detection in supervision.

<https://github.com/roboflow/supervision/pull/1502>

**matplotlib:** <https://github.com/matplotlib/matplotlib>

- modified matplotlib internals to make plotting significantly faster with PyTorch and JAX arrays.

<https://github.com/matplotlib/matplotlib/pull/25887>

**Stheno:** <https://github.com/wesselb/stheno>

- Added a sparse Gaussian process method called FITC<sup>1</sup>

<https://github.com/wesselb/stheno/pull/17>

**GPyTorch:** <https://github.com/cornellius-gp/gpytorch>

- Added metrics module to GPyTorch

<https://github.com/cornellius-gp/gpytorch/pull/1870>

- Added Type hints and exceptions in kernels

<https://github.com/cornellius-gp/gpytorch/pull/1802>

---

<sup>1</sup>Edward Snelson and Zoubin Ghahramani. Sparse Gaussian processes using pseudo-inputs. In Y. Weiss, B. Schölkopf, and J. Platt, editors, Advances in Neural Information Processing Systems, volume 18. MIT Press, 2006

## INDUSTRIAL EXPERIENCE

---

### Data Scientist in R&D team

Inspirisys Solutions Ltd., Chennai, India

Jun 2019 - Dec 2019

## TEACHING EXPERIENCE

---

Graduate Teaching Fellow (teaching a course along with the instructor)

- **Probabilistic Machine Learning**

IIT Gandhinagar

Fall 2022

Teaching Assistant

- **Probabilistic Machine Learning**

IIT Gandhinagar

Fall 2023

- **Machine Learning**

IIT Gandhinagar

Spring 2023

- **Machine Learning**

IIT Gandhinagar

Spring 2022

Guest lectures

- **Introduction to Active Learning**

Ubiquitous computing, IIT Gandhinagar

Fall 2021

- **Introduction to Bayesian Machine Learning**

Machine Learning, IIT Gandhinagar

Spring 2021

## SERVICE

---

### Reviewer

- Annual Conference on Neural Information Processing Systems (CORE A\*)

2024

- Association for the Advancement of Artificial Intelligence (AAAI) (CORE A\*)

2024

- Artificial Intelligence and Statistics (AISTATS) (CORE A)

2023

- ACM COMPASS Posters and Demos

2021

- The ReScience C journal