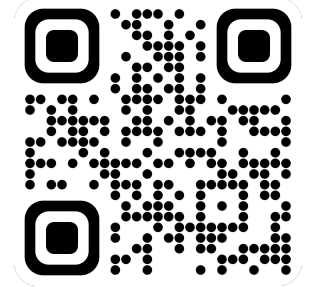


# Zeel B Patel

Date of Birth: 04 Aug 1996 (28 years old)  
Nationality: Indian  
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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](#)  
CGPA: 9.65/10.0  
IIT Gandhinagar, Gujarat, India
- **M.Tech (Specialization: Smart Manufacturing)**, Aug 2017 - May 2019  
CGPA: 9.17/10.0  
IIITDM Kancheepuram, Chennai, India

## 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>

### 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*  
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

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### 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 Compute grant 2021 (\$5000 credits in Google Cloud Platform)

## BOOKS CONTRIBUTIONS

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- **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 joint effort with my advisor and Prof. [Ashish Tendulkar](#) to pragmatically explain ML concepts with interactive codes and visualizations. Currently, we are refactoring it as a mirror copy of probabilistic machine learning book by Dr. Kevin Murphy.

## INTERSHIPS

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

## INVITED TALKS

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- **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

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- **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

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**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>

**Scikit-learn:** <https://github.com/scikit-learn/scikit-learn>

- Accelerated a slow example in scikit-learn  
<https://github.com/scikit-learn/scikit-learn/pull/21673>

## INDUSTRIAL EXPERIENCE

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**Data Scientist in R&D team**  
Inspirisys Solutions Ltd., Chennai, India

*Jun 2019 - Dec 2019*

## TEACHING EXPERIENCE

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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

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<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

- **Introduction to Active Learning**  
*Ubiquitous computing, IIT Gandhinagar*
- **Introduction to Bayesian Machine Learning**  
*Machine Learning, IIT Gandhinagar*

*Fall 2021*

*Spring 2021*

## **SERVICE**

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### **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