

# Zeel B Patel

Date of Birth: 04 Aug 1996 (26 years old)  
Nationality: Indian  
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GitHub: <https://github.com/patel-zeel>

## EDUCATION

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- PhD in Computer Science,** *Jan 2020 - Present*  
Research Topic: Developing ML methods for fine-grained air quality inference and active station deployment.  
Advisor: Nipun Batra  
CGPA: 9.59/10.0  
IIT Gandhinagar, Gujarat, India
- M.Tech. in Mechanical Engineering (Specialization: Smart Manufacturing),** *Aug 2017 - May 2019*  
CGPA: 9.17/10.0  
IIITDM Kancheepuram, Chennai, India
- B.E. in Mechanical Engineering,** *Aug 2013 - May 2017*  
CGPA: 7.52/10.0  
Kadi Sarva Vishwavidyalaya, Gandhinagar, India
- HSC [Class XII] (Gujarat Higher Secondary Board),** *Apr 2011 - Mar 2013*  
Ved International School, Gandhinagar, Gujarat, India  
Percentage: 79.69/100
- SSC [Class X] (Gujarat Higher Secondary Board),** *Apr 2010 - Mar 2011*  
Sardar Patel High School, Indraprastha, Anjar, Gujarat, India  
Percentage: 84.8/100

## PUBLICATIONS (GOOGLE SCHOLAR PROFILE)

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### Selected Peer-reviewed articles

- 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>
- Rishiraj Adhikary, **Zeel B Patel**, Tanmay Srivasatava, Nipun Batra, Mayank Singh, Udit Bhatia  
*Vartalaap: What Drives #AirQuality Discussions: Politics, Pollution or Pseudo-science?*  
CSCW Journal 2021 (CORE A)  
GitHub repo: <https://github.com/rishi-a/Vartalaap>
- Karm Patel, Rishiraj Adhikary, **Zeel B Patel**, Nipun Batra  
*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

- 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\*)
- 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
- 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\*)

4. **Zeel B Patel**, Nipun Batra  
*Towards Active Air Quality Station Deployment*  
SubSetML Workshop, ICML 2021 (CORE A\*)
5. **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>
6. **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/>

## INTERNSHIPS

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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

## 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.

## OPEN SOURCE LIBRARIES

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**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

## MAJOR OPEN SOURCE CONTRIBUTIONS

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**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>

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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

- 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>

**PyMC:** <https://github.com/pymc-devs/pymc>

- Added a few distribution moments to pymc  
<https://github.com/pymc-devs/pymc/pull/5173>  
<https://github.com/pymc-devs/pymc/pull/5154>

## AWARDS

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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)

## 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

**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

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### Reviewer

- Artificial Intelligence and Statistics (CORE A) 2023
- ACM COMPASS Posters and Demos 2021
- The ReScience C journal