Zeel B Patel

Date of Birth: 04 Aug 1996 (26 years old)
Nationality: Indian
Website: https://patel-zeel.github.io/

Email: patel_zeel@iitgn.ac.in
GitHub: https://github.com/patel-zeel

Education

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 (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. 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
3. 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

1. **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*)
2. 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
3. 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

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

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

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

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

Stheno: https://github.com/wesselb/stheno

- Added a sparse Gaussian process method called FITC[1]
  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

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

[1] 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

Awards

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

Data Scientist in R&D team *Jun 2019 - Dec 2019*
Inspirisys Solutions Ltd., Chennai, India

Teaching Experience

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

Reviewer

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

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