HETVI JETHWANI

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Education

Imperial College London   **2022 - 2026 (expected)**

Doctor of Philosophy from the EPSRC CDT in Modern Statistics and Statistical Machine Learning

Indian Institute of Technology Delhi   **2018-2022**

Bachelor of Technology in Mathematics and Computing; Department rank 5 out of ≈ 50   *GPA: 9.4/10.00*

Academic Publications

Conference

- **Hetvi Jethwani Multi Value Alignment: four steps for aligning ML/AI development choices with multiple values.** *Extended abstract selected for student funding, in the ACM Conference on AI, Ethics, and Society*, forthcoming
- **Organizers of Queer in AI, et al. Queer In AI: A Case Study in Community-Led Participatory AI.** *Paper in the ACM Conference on Fairness, Accountability, and Transparency*, **best paper award**.
- **Hetvi Jethwani** and Sumeet Agarwal. **Examining forms of inductive bias towards 'simplicity' in genetic algorithms to enhance evolvability of boolean functions.** *Short-paper in Proceedings of the Genetic and Evolutionary Computation Conference Companion (GECCO)*, France, July 2021.
- **Hetvi Jethwani** and Bhumika Chopra. **Parkinson's Disease Detection using Imputed Multimodal Datasets.** *Extended-abstract in the 16th Women in Machine Learning Workshop co-located with NeurIPS*, Australia, Dec. 2021.

Journal

- Sergio M. Navarro, Hashim Shaikh, Nory Klop-Packel, **Hetvi Jethwani**, Jimmy Wu, Jeffrey Sutton. **The Impact of Additive Manufacturing for Medical Care Delivery in Space: A Systematic Review.** In *Advanced Materials Technologies (Wiley)*, 2021.

Other

- Organizers of Queer in AI, **Hetvi Jethwani**, Arjun Subramonian, William Agnew, MaryLena Bleile, Sarthak Arora, Maria Ryskina, Jeffrey Xiong. **Queer in AI.** In *XRDS: Crossroads, The ACM Magazine for students, Volume 28, Issue 4*, 2022.

Research Experience

Aligning ML/AI development choices with multiple values   **2023-**

Dr. Anna Lewis, Harvard University

- Characterizing a four-step process for ML/AI developers seeking to build value-aligned systems, to help them 1) Identify the values that matter, 2) Specify identified values, 3) Find solution spaces that allow for maximal alignment with identified values, and 4) Make hard choices if there are inevitable trade-offs between the identified values

Improving Bayesian methods for cell clustering by incorporating lineage information   **2022-**

Prof. Nick Jones, Imperial College London   *Python*

- Improving the Hierarchical Poisson Factorization pipeline used for clustering scRNA-seq data by incorporating cell lineage information through a Gaussian Process prior;

Summarizing machine learning model predictions (Mitacs Globalink Research Internship)   **2021**

Prof. Laks Lakshmanan, University of British Columbia, and Dr. Divesh Srivastava, AT&T Research   *Java*

- Proposed an optimal algorithm to summarize predictive outputs represented as histograms over multidimensional data; Created an exploratory demo for the same, to facilitate adversarial user-interaction; *Demo paper draft in preparation*
- Formalized an alternate version, where we constrain the cost of representation; Examined its computational complexity with respect to different metrics; Proposed and analysed efficient algorithms for the L_∞ case; *Paper draft in preparation*

Examining the role of priors in the evolvability of boolean functions   **2020-2022**

Supervised by Prof. Sumeet Agarwal, Indian Institute of Technology, Delhi   *Python*

- Studying the role that different kinds of inductive bias over the mutation space play; Used it to propose 3 frameworks to establish equivalence between genetic algorithms with learning theoretic, and algorithmic information theoretic priors
- Examined ways to specify complexity of functions, function classes and its relation to evolvability; Exploring how varying representation space of individuals affects their approximate Kolomogrov complexity;

Analysis of hierarchical, bandit-based optimization algorithms   **2020-2021**

Supervised by Prof. Simon Du, University of Washington

- Theoretically analysed LA-MCTS, an algorithm for black-box optimization; Building upon approaches involving hierarchical multi-armed bandit frameworks, monte carlo tree search, and discrete convex analysis;

Projects

Kolam as a kinetic installation
Timeblur Studio, Delhi
2022
p5.js
- Created generative algorithms for an aesthetic, meditative display based on a traditional South Indian artform

Poem to state machine
Personal Project
2021-
Processing; Python
- Made performace tool to represent a poem like a finite automata; Examining applications to the analysis of form poetry

Data imputation on multimodal datasets for Parkinson's disease classification
Course project for data mining (course coordinator- Prof. Niladri Chatterjee)
2021
Python
- Performed missing value imputation using a generative adversarial network over small, multi-modal datasets to increase deployability & proposed a hybrid classification algorithm; Achieved accuracy of 93.5%; *Accepted at WiML, NeurIPS*

Optimized 3D printed splints for wrist theraputics in space
Baylor College of Medicine
2020
MATLAB
- Created 6 fitness metrics to quantify splint-fit measures; Developed a UI to enable easy fitness analysis by medical staff

Scholastic Achievements

Only undergraduate to be awarded the **ACM-W scholarship** sponsored by Google to attend GECCO — **2021-22**

IIT-D Merit list: top 7% amongst 900+ batchmates, fall semester 2018-19; department top 3, spring semester 2020-21

Awarded KVPY, a goverment **Fellowship in Basic Sciences**; Ranked in the national top 0.07% — **2017-18**

Secured all India rank of 645, amongst 2,00,000+ students in the the the **Joint Entrance Examination-Advanced** — **2017-18**

National Standard Examinations in Physics and Astronomy: Ranked in the top 1% — **2017-18**

Teaching Experience & Science Outreach

Teaching Assistant for MTL100
Part of a team of ≈ 30 TAs for an introductory Calculus course with ≈ 1000 students enrolled
2021-22
- Taking weekly tutorial sessions for 30 students, resolving queries posted on piazza, involved in grading; Maintaining a blog (creativecalculus.super.site) to help students visualize difficult concepts and retain their interest in the course

Art of Problem Solving
Grader, message board moderator (part of the office hours Halpers group), and teaching assistant (alias- @cosmicbhejafry)
2020-
- TA for Intermediate Algebra (ongoing), Introduction to Number Theory, Introduction to Counting and Probability

SheCodes Foundation
Facilitator at Government Girls Senior Secondary School No.3, Kalkaji, Delhi
2020-
- Mentored 40 female students aged 10-12; taught them the basics of coding using Scratch and animation using FlipaClip

Mentor, Board for Student Welfare, for 5 1st year students to help them adjust to college life
2020-21

Speaker, Talk To A Scientist webinar series for children aged 6-16: talk on evolution and learning
S8, 2021

Creative Coding Workshop Facilitator At Design Club, IIT-D (2021); For Backlash Literary Magazine (2022)

Technical Skills

Languages: Python, MATLAB, Java, C++, TeX, GLSL, C, Asymptote

Other frameworks: VS Code, Eclipse, Git, Hugo, Autodesk Inventor, Krita, SparkAR, Processing, p5.js, Unix

Python libraries: TensorFlow, PyTorch, Keras, Scikit-Learn, Numpy, Pandas, OpenCV, PIL, PyQuil, PyBDM

Volunteering

Queer in AI
Core Organizer, organizing conference workshops and moderating our financial aid programs
2021-

Indradhanu
Volunteer at IIT Delhi's queer collective, advocated for institutional recognition
2018-2022

Extra-curriculars: Art, Poetry, Quizzing, etc.

Created **4 Augmented Reality (AR) installations** as part of the *Getting Situated with Augmented Reality* program; organized by the School For Poetic Computation, New York, taught by Zach Lieberman and Edgardo Avilés-López

Artist, especially interested in generative art, AR & zines; Co-founded an art and literature newsletter with 300+ subscribers; Artwork can be found here- https://cosmicbhejafry.github.io/art/, or here- https://instagram.com/cosmicbhejafry

Poet; published in Perverse, Resistance AI-NeurIPS, etc. Full list of publications: https://cosmicbhejafry.github.io/poetry/

Enjoys **quizzing** & **making quizzes**; most recently conducted the weird quiz at Rendezvous, 2020-21 (Asia's largest cultural fest) & co-conducted the inclusivity quiz for a student-organized fest for COVID relief which raised close to Rs.1,00,000

Awards given by BRCA, IIT-D (2019-21): Best Fresher, Literary Club; Best Representative, Quizzing Club

Former positions of responsibility (2019-20): Creative writing and poetry director, Literary Club; Journalist, Board of Student Publications; Quizzing Club Representative, Himadri Hostel; Member of research team, Physics and Astronomy Club