Vijay Keswani

New Haven, Connecticut 06511
✉ vijay.keswani@yale.edu
🖰 vijaykeswani.github.io

Education

2019	**Ph.D. candidate, Statistics and Data Science**, *Yale University, U.S.*
2017-2019	**Computer Science**, *EPFL, Lausanne, Switzerland.*
2015-2016	**Master in Technology**, *Computer Science and Engineering, IIT Kanpur, India.*
2011-2016	**Bachelor in Technology**, *Computer Science and Engineering, IIT Kanpur, India.*

Experience

Publications

KDD 2021 — **Auditing for Diversity using Representative Examples**, *Vijay Keswani, L. Elisa Celis.*
A cost-effective approach to approximate the disparity of any given unlabeled dataset, with respect to a protected attribute, using a small set of labeled representative examples.

AIES 2021 — **Towards Unbiased and Accurate Deferral to Multiple Experts**, *Vijay Keswani, Matthew Lease, Krishnaram Kenthapadi.*
A framework to learn a classifier and a deferral model that defers to a domain expert in cases where the classifier has low confidence in its inference.

ICML 2021 — **Fair Classification with Noisy Protected Attributes: A Framework with Provable Guarantees**, *L. Elisa Celis, Lingxiao Huang, Vijay Keswani, Nisheeth K. Vishnoi.*
An optimization framework for learning a fair classifier in the presence of noisy perturbations in the protected attributes that comes with provable guarantees on both accuracy and fairness.

The Web Conf. 2021 — **Dialect Diversity in Text Summarization on Twitter**, *Vijay Keswani, L. Elisa Celis.*
Analysis of how standard text summarizations can under-represent certain dialects and application of a post-processing algorithm to generate dialect-diverse summaries for Twitter datasets.

CSCW 2020 — **Implicit Diversity in Image Summarization**, *L. Elisa Celis, Vijay Keswani.*
A post-processing algorithm for fair image search and summarization that uses a small set of diverse examples to induce diversity in the generated image summary.

ICML 2020 — **Data preprocessing to mitigate bias: A maximum entropy based approach**, *L. Elisa Celis, Vijay Keswani, Nisheeth K. Vishnoi.*
A pre-processing framework to mitigate biases that leverages the principle of maximum entropy.

FAT* 2019 — **Classification with Fairness Constraints: A Meta-Algorithm with Provable Guarantees**, *L. Elisa Celis, Lingxiao Huang, Vijay Keswani and Nisheeth K. Vishnoi.*
A meta-algorithm for fair classification takes the fairness type and constraint as input and returns a classifier which satisfies the fairness constraint at minimal cost to accuracy

ICML 2018 — **Fair and Diverse DPP-based Data Summarization**, *L. Elisa Celis, Vijay Keswani, Damian Straszak, Amit Deshpande, Tarun Kathuria, Nisheeth K. Vishnoi.*
A simple linear-time approximate algorithm for fair summarization that samples from DPP (Determinantal Point Process) distributions with fairness constraints.

IJCAI-ECAI 2018 — **Balanced News Using Constrained Bandit-based Personalization**, *Sayash Kapoor, Vijay Keswani, Nisheeth K. Vishnoi, L. Elisa Celis.*
A news-search prototype that de-polarizes the news feed by presenting balanced viewpoints across liberal and conservative articles.

Master's Thesis

2015-16 **Laplacian Solvers and Graph Sparsification**, *w/ Rajat Mittal*, CSE Department, IIT Kanpur.
This thesis explored the scope of spectral sparsification algorithms used in Laplacian solvers and the relations between different state-of-the-art Laplacian solvers.

Internships

2020 & 2021 **Human-in-the-loop deferral frameworks**, *w/ Krishnaram Kenthapadhi and Matthew Lease*, Amazon AWS.
Human-in-the-loop frameworks allow human experts to assist an automated predictor to improve the performance of any decision-making pipeline. Training these frameworks need to address issues regarding mechanism for eliciting human assistance and possible implicit biases in training data and human decisions. We propose training approaches that can handle such settings, ensuring that the final predictions are more accurate and fair than those of any automated predictor.

2014 **Validation of a Compiler for Critical Embedded Software**, *w/ Francesco Zappa Nardelli and Mark Pouzet*, INRIA, Paris-Rocquencourtand ENS, Paris.
Worked on the verification of a data synchronous language, called *Lustre*, by building a symbolic validation framework in OCaml. The verification framework generated the symbolic representation for Lustre programs and the resulting C programs, which were then compared using Z3 SMT solvers to authenticate their equivalence.

2013 **Study of Statistical Learning Algorithms**, *w/ Ambedkar Dukkipatti*, CSA Department, Indian Institute of Science, Bangalore.
Applied information theoretic concepts suggested by Kamal Nigam and Andrew McCallum, to get a better model for document classification.

Industry Experience

2016-2017 **Product Engineer**, *Sprinklr*, Gurgaon, India.
Sprinklr aimed to provide a single platform for social media management to enterprises. As part of the Advertisements team, we worked to ensure that our platform is always compatible with the current APIs of all relevant social networks, such as Facebook, Snapchat, etc. We also provided several novel analysis tools to the users to judge the performance of their ads and to maximize their returns from these ads.

Teaching Experience

2021 **Data Science Ethics**, *Teaching Assistant*, Yale University.

2020 **Multivariate Statistics for Social Sciences**, *Yale University*, Yale University.

2018 **Theory of Computation**, *Teaching Assistant*, EPFL.

2016 **Algorithms and Data Structures**, *Instructor*, ACA Summer School, IITKanpur.

2016 **Online Learning and Optimization**, *Teaching Assistant*, IIT Kanpur.

2015 **Theory of Computation**, *Teaching Assistant*, IIT Kanpur.

2015 **Data Structures and Algorithms**, *Teaching Assistant*, IIT Kanpur.

2014 **Data Structures and Algorithms**, *Teaching Assistant*, IIT Kanpur.

Skills

Programming *Advanced*: C, Python, R
Familiar: C++, Java, Haskell, Bash