Vijay Keswani

New Haven, Connecticut 06511
(475)-655-8485
vijay.keswani@yale.edu
vijaykeswani.github.io

Education

2019-now **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

2022 **Policy Fellow**, *Yale Institute of Social and Policy Studies (ISPS)*, U.S.
2021 & 2020 **Amazon AWS AI Summer Intern**, *Palo Alto*, U.S..
2016-2017 **Product Engineer**, *Sprinklr*, Gurgaon, India.
2014 **Research Intern**, *INRIA Paris-Rocquencourt and ENS*, Paris, France.
2013 **Research Intern**, *CSA Department, Indian Institute of Science*, Bangalore, India.

Research

Publications

BHCC 2021 **Designing human-in-the-loop approaches for closed deferral pipelines**, *Vijay Keswani, Matthew Lease, Krishnaram Kenthapadi.*
A closed pipeline design to combine label elicitation and learning components of a decision-making framework with an option of deferring to human experts for contentious input data.

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.

Working Papers

2022 **An Anti-subordination Approach to Fair Classification**, *Vijay Keswani, L. Elisa Celis*.
We use the legal framework of anti-subordination to study the motivations of a fair classifier and its applications. Using this principle, we propose guidelines that a fair machine learning algorithm could follow to ensure an equitable and progressive impact on the affected population.

2022 **Fairness Constraints for Strategic Settings**, *Vijay Keswani, L. Elisa Celis*.
In strategic settings, we show that fair classifiers do not address disparity in strategic manipulation cost across demographic groups. To address this, we propose a constrained optimization framework that constructs classifiers that lower the strategic manipulation cost for disadvantaged groups.

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.

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