# Sahil Verma

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## Research Interests

I am interested in exploring ways to make Machine Learning trustworthy, specifically in explainability and fairness.

## Education

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|---|---|
| Sept 2019 - Present | PhD in Computer Science<br>**University of Washington, Seattle**<br>Advisors: Prof. Chirag Shah and Prof. John Dickerson |
| July 2015 - July 2019 | BTech in Electrical Engineering<br>**Indian Institute of Technology Kanpur (IIT Kanpur)**<br>Advisor: Prof. Subhajit Roy |

## Honors and Awards

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|---|---|---|
| 2020 | Best Paper Award and Nvidia Titan RTX GPU | ML-RSA Workshop at NeurIPS |
| 2019 | Allen School Fellowship | Paul G. Allen School, UW |
| 2018 | Student Travel Award of $1500 | ACM SIGPLAN |
| 2017 | Student Travel Award of $1800 | Google India |
| 2015 | All India Rank 663 | IITJEE Advanced Exam |
| 2015 | KVPY Fellow with All India Rank 205 | IISc Bangalore |
| 2015 | Top 1% in National Standard Exam in Chemistry | HBCSE, Mumbai |
| 2015 | Top 1% in National Standard Exam in Biology | HBCSE, Mumbai |

## Publications

Amortized Generation of Sequential Counterfactual Explanations for Black-box Models
Sahil Verma, Keegan Hines, John P Dickerson

Counterfactual Explanations for Machine Learning: A Review
Sahil Verma, John Dickerson, Keegan Hines, *ML-RSA Workshop, NeurIPS 2020*
**Best Paper Award**

Removing biased data to improve fairness and accuracy
Sahil Verma, Michael Ernst, Rene Just

Facets of Fairness in Search and Recommendations
Sahil Verma, Ruoyuan Gao, Chirag Shah, *Algorithmic Bias Workshop at ECIR 2020*

Fairness Definitions Explained
Sahil Verma and Julia Rubin, *FairWare Workshop at ICSE 2017*

ShapeFlow: Dynamic Shape Interpreter for TensorFlow
Sahil Verma and Zhendong Su

Debug-Localize-Repair: A Symbiotic Construction for Heap Manipulations
Sahil Verma and Subhajit Roy, *FMSD Journal 2021*

Synergistic Debug-Repair for Heap Manipulations
Sahil Verma and Subhajit Roy, *ESEC/FSE 2017*

## Patents

Amortized Generation of Sequential Counterfactual Explanations for Black-box Models
Sahil Verma, Keegan Hines, John P Dickerson
*Patent Pending*

## Work Experience

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|---|---|
| June 2020 - Present | Research Fellow at Arthur AI<br>Industry deployable counterfactual explanation algorithm. |
| June 2019 – Sept 2019 | Research Intern at ETH Zurich<br>Tensor shape incompatibility bugs in TensorFlow models. |
| May 2018 – Aug 2018 | Research Intern at CSAIL, MIT<br>Floating bit allocation in programs. |
| May 2017 – Aug 2017 | Research Intern at NUS<br>Converting CSP programs into C programs. |

## Professional Responsibilities

- Reviewing: AAAI 2022, EAAMO 2021, AFCR Workshop at NeurIPS 2021, XAIF Workshop at ICAIF 2021, Data Mining and Knowledge Journal 2021.
- Student Volunteer at ESEC/FSE 2017.

## Coursework

| | | |
|---|---|---|
| Computer Vision | Deep Learning | Fairness in Machine Learning |
| Machine Learning | Convex Optimization | Reinforcement Learning |
| Probability and Statistics | Linear Algebra | Reasoning for Software |

## Teaching Experience

**Teaching Assistant:** Machine Learning (CSEP546), Introduction to Machine Learning (CSE 416)