

# Colin White

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RESEARCH INTERESTS	I am interested in automating, explaining, and de-biasing deep learning models, from both a theoretical and empirical lens. Much of my work involves designing innovative methods by drawing insights from large-scale studies and designing tools for better benchmarking of machine learning techniques.	
EXPERIENCE	<b>Abacus.AI</b> , San Francisco, CA <i>Head of Research</i> <i>Research Scientist</i>	<b>Oct. 2020 – Present</b> <b>May 2019 – Oct. 2020</b>
EDUCATION	<b>Carnegie Mellon University</b> , Pittsburgh, PA <i>Ph.D. in Computer Science</i> Advisor: Maria-Florina Balcan Thesis committee: Avrim Blum, Anupam Gupta, Yury Makarychev, and David Woodruff <b>Amherst College</b> , Amherst, MA <i>Double Major in Computer Science and Mathematics</i> GPA: 3.76/4.0	<b>Sep. 2014 – Dec. 2018</b> <b>Sep. 2010 – May 2014</b>
LEADERSHIP POSITIONS	Program Chair for AutoML-Conf 2023 Local Chair and Area Chair for AutoML-Conf 2022 Organizer for the AutoML Workshop at ICML 2021	<b>2023</b> <b>2022</b> <b>2021</b>
SELECTED HONORS AND AWARDS	Top 10% of reviewers at NeurIPS 2020, 2021, 2022 Top 10% of reviewers at ICML 2021, 2022 Top 10% of reviewers at ICLR 2022 2 <sup>nd</sup> place at the CVPR NAS unseen data competition (77 submissions) National Defense Science & Engineering (NDSEG) Fellowship Amherst Memorial Fellowship John Woodruff Simpson Fellowship Post-Baccalaureate Summer Research Fellowship, Amherst College Computer Science Prize (best thesis), Amherst College Henry F. Dunbar Award, Amherst College Swimming and Diving Team <i>Summa Cum Laude</i> (highest university honors), Amherst College	<b>2020 – 2022</b> <b>2021 – 2022</b> <b>2022</b> <b>Jun. 2021</b> <b>Sep. 2014 – Dec. 2018</b> <b>Sep. 2016 – Aug. 2017</b> <b>Sep. 2014 – Aug. 2016</b> <b>Sep. 2014</b> <b>May 2014</b> <b>May 2014</b> <b>May 2014</b>
JOURNAL PUBLICATIONS	For all publications, “With X, Y, Z” denotes alphabetically ordered authors, and * denotes equal contribution.  “ <i>k</i> -center Clustering under Perturbation Resilience.” With Maria-Florina Balcan and Nika Haghtalab. <i>Transactions on Algorithms (TALG)</i> 2020.  “Small dynamical heights for quadratic polynomials and rational functions.” With Rob Benedetto, Ruqian Chen, Trevor Hyde, and Yordanka Kovacheva. <i>Experimental Mathematics</i> , 2014.	
CONFERENCE PUBLICATIONS	“NAS-Bench-Suite-Zero: Accelerating Research on Zero Cost Proxies” Arjun Krishnakumar*, <u>Colin White</u> *, Arber Zela*, Renbo Tu*, Mahmoud Safari, Frank Hutter <i>Neural Information Processing Systems Datasets Track (NeurIPS Datasets)</i> , 2022.	

“On the Generalizability and Predictability of Recommender Systems”

Duncan McElfresh\*, Sujay Khandagale\*, Jonathan Valverde\*, John P. Dickerson, Colin White  
*Neural Information Processing Systems (NeurIPS)*, 2022.

“A Deeper Look at Zero-Cost Proxies for Lightweight NAS”

Colin White, Mikhail Khodak, Renbo Tu, Shital Shah, Sébastien Bubeck, Debadeepta Dey  
*International Conference on Learning Representations Blog Post Track (ICLR Blog Post) 2022*

“NAS-Bench-Suite: NAS Evaluation is (Now) Surprisingly Easy”

Yash Mehta\*, Colin White\*, Arber Zela, Arjun Krishnakumar, Guri Zabergja, Shakiba Moradian,  
Mahmoud Safari, Kaicheng Yu, Frank Hutter  
*International Conference on Learning Representations (ICLR)*, 2022.

“Synthetic Benchmarks for Scientific Research in Explainable Machine Learning”

Yang Liu\*, Sujay Khandagale\*, Colin White, Willie Neiswanger  
*Neural Information Processing Systems Datasets Track (NeurIPS Datasets)*, 2021.

“NAS-Bench-x11 and the Power of Learning Curves”

Shen Yan\*, Colin White\*, Yash Savani, Frank Hutter  
*Neural Information Processing Systems (NeurIPS)*, 2021.

“How Powerful are Performance Predictors in Neural Architecture Search?”

Colin White, Arber Zela, Binxin Ru, Yang Liu, Frank Hutter.  
*Neural Information Processing Systems (NeurIPS)*, 2021.

“Exploring the Loss Landscape in Neural Architecture Search”

Colin White, Sam Nolen, Yash Savani.  
*Conference on Uncertainty in Artificial Intelligence (UAI)*, 2021.

“BANANAS: Bayesian Optimization with Neural Architectures for Neural Architecture Search.”

Colin White, Willie Neiswanger, Yash Savani.  
*AAAI Conference on Artificial Intelligence (AAAI)*, 2021.

“A Study on Encodings for Neural Architecture Search.”

Colin White, Willie Neiswanger, Sam Nolen, Yash Savani.

**Selected for spotlight presentation.**

*Neural Information Processing Systems (NeurIPS)*, 2020.

“Intra-Processing Methods for Debiasing Neural Networks.”

Yash Savani, Colin White, Naveen Govindarajulu.

*Neural Information Processing Systems (NeurIPS)*, 2020.

“Robust Communication-Optimal Distributed Clustering Algorithms.”

With Pranjal Awasthi, Ainesh Bakshi, Maria-Florina Balcan, and David Woodruff.  
*International Colloquium on Automata, Languages, and Programming (ICALP) 2019*.

“Data-Driven Clustering via Parameterized Lloyd’s Families.”

With Maria-Florina Balcan and Travis Dick.

**Selected for spotlight presentation.**

*Neural Information Processing Systems (NeurIPS) 2018*.

“Learning-Theoretic Foundations of Algorithm Configuration for Combinatorial Partitioning Problems.”

With Maria-Florina Balcan, Vaishnavh Nagarajan, and Ellen Vitercik.  
*Conference on Learning Theory (COLT) 2017*.

“Data Driven Resource Allocation for Distributed Learning.”

With Travis Dick, Mu Li, Krishna Pillutla, Maria-Florina Balcan, and Alex Smola.  
*International Conference on Artificial Intelligence and Statistics (AISTATS) 2017*.

“Learning Combinatorial Functions from Pairwise Comparisons.”

With Maria-Florina Balcan and Ellen Vitercik.

*Conference on Learning Theory (COLT) 2016.*

“ $k$ -center Clustering under Perturbation Resilience.”

With Maria-Florina Balcan and Nika Haghtalab.

*International Colloquium on Automata, Languages, and Programming (ICALP) 2016.*

“Lower Bounds in the Preprocessing and Query Phases of Routing Algorithms.”

Colin White.

*European Symposium on Algorithms (ESA) 2015.*

#### THESES

“New Aspects of Beyond Worst-Case Analysis.”

Colin White.

*Ph.D. Thesis, Carnegie Mellon University, 2018.*

“Lower Bounds in the Preprocessing and Query Phases of Routing Algorithms.”

Colin White.

*Undergraduate Thesis, Amherst College, 2014.*

#### WORKSHOP PUBLICATIONS

“AutoML for Climate Change: A Call to Action”

Renbo Tu, Nicholas Roberts, Vishak Prasad, Sibasis Nayak, Paarth Jain, Frederic Sala, Ganesh Ramakrishnan, Ameet Talwalkar, Willie Neiswanger, Colin White

*NeurIPS Workshop on Tackling Climate Change with Machine Learning, 2022*

“On the Importance of Architectures and Hyperparameters for Fairness in Face Recognition” Rhea Sukthanker\*, Samuel Dooley\*, John P. Dickerson, Colin White, Frank Hutter, Micah Goldblum

*NeurIPS Workshop on Meta Learning, 2022, and*

*NeurIPS Workshop on Trustworthy and Socially Responsible Machine Learning, 2022.*

“Speeding up NAS with Adaptive Subset Selection”

Vishak Prasad, Colin White, Paarth Jain, Sibasis Nayak, Rishabh Iyer, Ganesh Ramakrishnan

*AutoML-Conf Late-Breaking Workshop, 2022.*

“On the Generalizability and Predictability of Recommender Systems”

Duncan McElfresh\*, Sujay Khandagale\*, Jonathan Valverde\*, John P. Dickerson, Colin White

*AutoML-Conf Late-Breaking Workshop, 2022.*

“Synthetic Benchmarks for Scientific Research in Explainable Machine Learning”

Yang Liu\*, Sujay Khandagale\*, Colin White, Willie Neiswanger

*ICML Workshop on Explainable AI, 2021.*

“NAS-Bench-x11 and the Power of Learning Curves”

Shen Yan\*, Colin White\*, Yash Savani, Frank Hutter

*CVPR Workshop on Neural Architecture Search, 2021.*

“How Powerful are Performance Predictors in Neural Architecture Search?”

Colin White, Arber Zela, Binxin Ru, Yang Liu, Frank Hutter.

**Selected as a contributed talk.**

*ICLR Workshop on Neural Architecture Search, 2021.*

“A Study on Encodings for Neural Architecture Search.”

Colin White, Willie Neiswanger, Sam Nolen, Yash Savani.

*ICML Workshop on AutoML, 2020.*

“Local Search is State of the Art for Neural Architecture Search Benchmarks.”

Colin White, Sam Nolen, Yash Savani.

*ICML Workshop on AutoML, 2020.*

“Neural Architecture Search via Bayesian Optimization with a Neural Network Prior.”

Colin White, Willie Neiswanger, Yash Savani.

*NeurIPS Workshop on Meta Learning*, 2019.

“Deep Uncertainty Estimation for Model-based Neural Architecture Search.”

Colin White, Willie Neiswanger, Yash Savani.

*NeurIPS Workshop on Bayesian Deep Learning*, 2019.

“DECO: Debiasing through Compositional Optimization of Machine Learning Models.”

Naveen Govindarajulu, Colin White.

*NeurIPS Workshop on Robust AI in Financial Services*, 2019.

“Differentiable Functions for Combining First-order Constraints with Deep Learning via Weighted Proof Tracing.”

Naveen Govindarajulu, Colin White.

*NeurIPS Workshop on Knowledge Representation to ML*, 2019.

“Data Driven Resource Allocation for Distributed Learning.”

With Travis Dick, Mu Li, Krishna Pillutla, Maria-Florina Balcan, and Alex Smola.

*AAAI Workshop on Distributed Machine Learning*, 2019.

“An Improved Parallel Iterative Algorithm for Stable Matching.”

Colin White, Enyue Lu.

*SuperComputing Poster*, 2013.

SELECTED  
TALKS

*Neural Architecture Search: The Next Frontier.*

Tutorial at AutoML Fall School 2022 (virtual).

**Oct. 2022**

Microsoft Research Redmond (virtual).

**Aug. 2022**

Tutorial with Debadepta Dey at AutoML-Conf 2022 in Baltimore, MD.

**Jul. 2022**

AutoML Seminar, ELLIS Berlin (virtual).

**Nov. 2020**

*Research Methodology.*

Judson University (virtual).

**Nov. 2021**

*AutoML: AI that Builds AI.*

PhxMobi Emerging Tech Festival (virtual).

**Nov. 2021**

*AutoML Panel Discussion.*

AutoML Seminar, ELLIS Berlin and Freiburg, Germany (virtual).

**Oct. 2021**

NAS Workshop at ICLR 2021 (virtual).

**May 2021**

*An Introduction to Neural Architecture Search.*

Abacus.AI webinar.

**Oct. 2020**

Abacus.AI workshop.

**Dec. 2019**

AICamp webinar.

**Jul. 2019**

*Data-Driven Clustering via Parameterized Lloyd’s Families.*

Automated Algorithms Seminar at CMU.

**May 2018**

*Robust Communication-Optimal Distributed Clustering Algorithms.*

Theory Lunch Seminar at CMU.

**Apr. 2017**

*k-center Clustering under Perturbation Resilience.*

Simons Institute BWCA Workshop.

**Nov. 2016**

Theory Lunch Seminar at CMU.

**Sep. 2016**

Machine Learning Dept. Journal Club Class at CMU.

**Sep. 2016**

Dagstuhl Workshop on Learning Theory.

**Aug. 2015**

MENTORING

*Deep Learning Indaba Mentor for early-career researchers*

**2022 - present**

*LatinX AI (LXAI) Mentor for early-career researchers*

**2021 - present**

*Abacus.AI Mentor for early-career researchers*

**2019 - present**

SERVICE	<i>Journal reviewer for JMLR, TPAMI, TALG, Algorithmica</i>	<b>2015 – present</b>
	<i>Conference reviewer for NeurIPS, ICML, ICLR, AISTATS, AAAI, UAI, FOCS, STOC, SODA, ITCS</i>	<b>2015 – present</b>
	<i>Doctoral Review Committee Member, CMU</i>	<b>2015 – 2018</b>
	A panel of graduate students and faculty who oversee the Ph.D. program	
	<i>FreeCSD, a social organization for the Ph.D. department at CMU</i>	<b>2015 – 2018</b>
	<i>Theory Lunch Organizer, CMU</i>	<b>2016</b>
	<i>Ph.D. Admitted Students Open House Organizer, CMU</i>	<b>2016</b>