

Roy Rinberg

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Github: RoyRin

EDUCATION	Harvard University, Cambridge, MA 2023 - PRESENT PhD. Computer Science. Advisors: Prof. Seth Neel and Prof. Salil Vadhan
	Columbia University, New York, NY 2021 - 2023 MS in Computer Science [Thesis Track]. Advisors: Prof. Rachel Cummings and Prof. Steven Bellovin
	New York University, New York, NY 2014 - 2018 B.A. Computer Science, Physics, Minor: Math.
	Thomas Jefferson High School for Science and Technology, Alexandria, VA 2010 - 2014
RESEARCH EXPERIENCE	Harvard University, Cambridge, MA AUG. 2023 - PRESENT Trustworthy Machine Learning [Advisors: Prof. Seth Neel and Prof. Salil Vadhan] <ul style="list-style-type: none">Research on how foundations of machine learning and fundamentals of Differential Privacy (DP).
	Columbia University, New York, NY AUG. 2021 - AUG. 2023 Privacy in ML [Advisors: Prof. Rachel Cummings and Prof. Steven Bellovin] <ul style="list-style-type: none">Extensions of Gaussian & Laplace DP primitives, and their application to ML. <i>In Submission</i>.Research on Catered PATE - PATE in the presence of heterogenous data (link). <i>On-going</i>.Research on how ML algorithms memorize training data.
	Vector Institute, Toronto, ON MAY 2022 - SEP. 2022 Privacy in Machine Learning [Advisor: Prof. Nicolas Papernot] <ul style="list-style-type: none">Research on Individualization of PATE (accepted to PoPETs 2023) and individualization of DP-SGD (accepted to Neurips 2024).Research on reducing distributional and user-preference-level assumptions in private ML.
	New York University, New York, NY FEB. 2017 - MAY 2018 Evolution of Language Models within Social Networks [Advisor: Prof. Bud Mishra] <ul style="list-style-type: none">Studied the development of echo chambers within social networks using TDA to study distances between Word2Vec models trained on Reddit text. Preprint on arXiv.
WORK EXPERIENCE	Shelton AI, New York, NY JAN. 2022 - JUN. 2022 Lead Software Engineer <i>Shelton AI leverages machine learning to help pension funds manage investments in private equity.</i> <ul style="list-style-type: none">Worked with CEO to develop fintech product to manage 10s of millions of dollars.Developed core AWS infrastructure for NLP document processing pipeline.
	Ouster, San Francisco, CA JUN. 2018 - JUL. 2021 Software Engineer <i>Ouster is a startup developing lidar sensors. I worked on lidar-based collision-avoidance systems</i> <ul style="list-style-type: none">Led development of on-edge computing for live predictions about dangerous driving.Developed platforms for evaluating algorithms on historical lidar data and monitoring live data.<i>Internship Project</i>: Produced open-source C++ lidar point-cloud data visualizer (Github link).
	Career Copilots, San Francisco CA MAY 2020 - AUG. 2020 Software Engineer <i>Career Copilots is a startup seeking to help individuals find jobs using LinkedIn data.</i> <ul style="list-style-type: none">Developed web-scraping data-exploration pipeline of jobs-data to help users find relevant roles.
INTERNSHIPS	Knight First Amendment Institute, New York, NY SEPT. 2022 - MAY 2023 Algorithmic Amplification in Society [Advisor: Professor Arvind Narayanan] <i>KFAI works to protect digital freedoms through strategic litigation, research, and education.</i> <ul style="list-style-type: none">Work with Professor Arvind Narayanan to develop essays, videos, and interactives for explaining how algorithmic amplification can affect speech online.

	Hong Kong University for Science and Technology, Hong Kong	SUMMER 2016
	Research in Industrial Projects for Students (RIPS-HK) [Advisor: Dr. Avery Ching]	
	<i>RIPS-HK is an REU with HKUST and an industrial sponsor.</i>	
	<ul style="list-style-type: none"> • Developed protocol for robust, acoustic communication by underwater drones in noisy channels. • Team lead for team of 3 other students. 	
	Janelia Research Campus, HHMI, Ashburn, VA	SUMMER 2015
	Scientific Computing Group [Advisors: Dr. Khaled Khairy and Dr. Sean Murphy]	
	<i>Janelia Research Campus is a neuroscience and imaging research center.</i>	
	<ul style="list-style-type: none"> • Decreased stitching time from 13.7 sec/image-pair to 1.8 sec/image-pair, using OpenCV and OpenMP on GPU cluster, on the Stitching Multi-Terrabyte ssTEM Image Data project. 	
	Weizmann Institute of Science, Rehovot, Israel	SUMMER 2014
	International Summer Science Institute (ISSI) [Advisor: Prof. Roe Ozeri]	
	<i>ISSI is an international internship for natural sciences and math. I worked in the Trapped Ions Lab.</i>	
	<ul style="list-style-type: none"> • Developed data visualization to study ultra-cold atoms in a laser-cooled Magneto-Optical Trap. 	
PAPERS	<ol style="list-style-type: none"> 1. F. Boenisch, C Mühl, A. Dziedzic, R. Rinberg, N. Papernot. Have it your way: Individualized Privacy Assignment for DP-SGD. Accepted to Neurips 2023. 2. F. Boenisch, C Mühl, R. Rinberg, J. Ihrig, A. Dziedzic. Individualized PATE: Differentially Private Machine Learning with Individual Privacy Guarantees. Accepted to PoPETs 2023. 3. A. Tamaskar, R. Rinberg, S. Chakraborty, B. Mishra. <i>Creolizing the Web</i>. arXiv:2102.12382 . 	
PRE-PRINTS	<ol style="list-style-type: none"> 1. R. Rinberg and A. Nichani. <i>Improvements and Analysis of Private Ensemble-Based Federated Learning</i>. Pre-Print. 2021. 2. R. Rinberg, N. Agarwal. <i>Privacy when Everyone is Watching: An SOK on Anonymity on the Blockchain</i>. ePrint. 	
ARTICLES	<ol style="list-style-type: none"> 1. R. Rinberg. <i>Resources for Public-Interest Technology</i>. Medium (self-published). 2020. Comprehensive list of resources for working in Public-Interest Technology. Link. 2. R. Rinberg. <i>Jell-O Brains and DNA: High School Students Launch Innovative STEM Program</i>. Scientific American. 2014. Invited article in 'Budding Scientist' series describing work leading Project BEST. Link. 	
TEACHING	NYU - General Physics I and II Tutor	SEP. 2017 - MAY 2018
	<ul style="list-style-type: none"> • Tutored physics courses on classical mechanics and electricity & magnetism. 	
AWARDS, MEMBERSHIPS, CONFERENCES	Columbia Advanced Master's Research Specialization	2022-2023
	Workshop on DP and Statistical Data Analysis (Toronto, ON)	SUMMER 2022
	Differential Privacy Summer School (Boston, MA)	SUMMER 2022
	Presidential Honors Scholar (NYU)	2015 - 2018
	Dean's List (NYU)	2014 - 2018
	Sigma Pi Sigma (Physics Honor Society) (NYU)	INDUCTED 2018
	HPC for Undergraduates - Conference Scholarship for SC'17	FALL 2017
	DURF & Research+ for Housing and Stipend (NYU)	SUMMER 2017
COMMUNITY ENGAGEMENT	Technically Private	2021 - PRESENT
	Organizer and Founder	
	<i>Technically Private is a group of graduate students that work in privacy and security spaces</i>	
	<ul style="list-style-type: none"> • Organize group of inter-university graduate students in the privacy and security spaces, across legal, policy, and technical domains. 	
	Project BEST (Building Excitement for Science and Technology)	2011 - 2014
	CFO and Co-founder	
	<i>Project BEST is a non-profit which develops after-school STEM programs for middle school students.</i>	
	<ul style="list-style-type: none"> • Fundraised and grew organization to 25 chapters across 3 states, reaching 3000+ students. • Led two full-day STEM programs for 100+ students, and co-led team of 20 volunteers. 	
	Ouster Community Work	2018-2020
	<ul style="list-style-type: none"> • Advocated management to institute paid volunteer-day and donate \$6k to 6 public-interest orgs. 	

COURSES AND
SOFTWARE SKILLS

Selected CS Coursework: Neural Networks, Cryptography, ML, Computational Learning Theory, Foundations of Blockchain, Security, Theory of Computation, Operating Systems, Computer Systems Organization

Selected Interdisciplinary Coursework: Anonymity and Privacy, Policy for Privacy Technology

Selected Math Coursework: Honors Algebra, Analysis, Probability, Linear Algebra, Statistics

Software and Programming Languages: Python, C, C++, Go, Linux, Pytorch, Tensorflow, Docker, AWS, Google Cloud Services, ROS, ELK Stack, Pandas, Jenkins, Artifactory, SQL, Web-scraping, Opacus