

David Freeman

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dfreeman@gmail.com

EXPERIENCE

Meta Platforms, Inc. (formerly Facebook)

Menlo Park, California USA

Research Scientist/Engineer

2017–present

- Tech lead on Verification team: Built AI-driven solutions to authenticate Meta users and advertisers.
- Tech lead on Anti-Scraping team: Analyzed trillions of HTTP requests per day for bot activity; built AI/ML to optimize bot-detection/user-friction tradeoffs; found and closed data-leakage vulnerabilities.
- Built ML solutions to identify and block spam and fake engagement.
- Published 5 research papers, served on Usenix/CCS program committees, chaired Enigma track.

LinkedIn Corporation

Mountain View, California USA

Senior Manager, Software Engineering

2012–2017

- Responsible for data science and engineering efforts to combat fraud and abuse in the LinkedIn product.
- Worked with LinkedIn ML teams to build modeling and scoring infrastructure.
- Partnered with product, analytics, and operations to measure and prioritize anti-abuse efforts.
- Published 4 research papers, filed for 9 patents, chaired CCS workshop on AI+Security.

Insight Data Science

Palo Alto, California USA

Data Science Fellow

Summer 2012

- Modeled causes of airline delays using DOT database of 120 million flights.

Stanford University Computer Science Department

Stanford, California USA

Centrum Wiskunde en Informatica (CWI) & Universiteit Leiden

Amsterdam & Leiden, Netherlands

NSF Postdoctoral Scholar

2008–2012

- Designed algorithms to authenticate cloud computing and improve security of network routing.
- Designed and prototyped algorithms and frameworks for efficient cryptosystems.
- Developed and taught Masters course on elliptic curve cryptography; published 12 research papers.

EDUCATION

University of California, Berkeley

Berkeley, California USA

Ph.D. in Mathematics, May 2008.

Thesis: “Constructing Abelian Varieties for Pairing-Based Cryptography”

Thesis awarded Bernard Friedman Memorial Prize in Applied Mathematics.

University of Cambridge

Cambridge, United Kingdom

Master of Advanced Study in Mathematics, with Distinction, June 2003.

Harvard University

Cambridge, Massachusetts USA

A.B. Summa Cum Laude in Chemistry and Physics and Mathematics, June 2002.

OTHER

ACTIVITIES

- Languages: English (native), French (proficient), Dutch (elementary).
- School volunteering: Coach of middle school math team, class parent representative.
- Classical music: piano, viola, singing; creator of www.ClassicalCDGuide.com.
- Activities: Swimming, bicycling, yoga, baseball/softball, foreign travel.

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RECENT PUBLICATIONS

1. G. Wilson, G. Goh, Y. Jiang, A. Gupta, J. Wang, D. Freeman, and F. Dinuzzo, "Predictive Response Optimization: Using Reinforcement Learning to Fight Online Social Network Abuse," *Usenix Security 2025*
2. G. Apruzzese, H. Anderson, S. Dambra, D. Freeman, F. Pierazzi, and K. Roundy, "Real Attackers Don't Compute Gradients: Bridging the Gap Between Adversarial ML Research and Practice," *SaTML 2023*
3. T. Xu, G. Goossen, H. K. Cevahir, K. Khodeir, Y. Jin, F. Li, S. Shan, S. Patel, D. Freeman, P. Pearce, "Deep Entity Classification: Abusive Account Detection for Online Social Networks," *Usenix Security 2021*
4. F. Li and D. Freeman, "Towards A User-Level Understanding of IPv6 Behavior," *IMC 2020*

TOP-CITED PUBLICATIONS

5. C. Chio and D. Freeman, *Machine Learning and Security: Protecting Systems with Data and Algorithms*, O'Reilly, 2018.
6. C. Xiao, D. M. Freeman, and T. Hwa, "Detecting Clusters of Fake Accounts in Online Social Networks," *AISec 2015*.
7. S. Agrawal, D. M. Freeman, and V. Vaikuntanathan, "Functional Encryption for Inner Product Predicates from Learning with Errors," *Asiacrypt 2011*
8. D. Boneh and D. M. Freeman, "Homomorphic Signatures for Polynomial Functions," *Eurocrypt 2011*.
9. D. Boneh and D. M. Freeman, "Linearly homomorphic Signatures over Binary Fields and New Tools for Lattice-Based Signatures," *PKC 2011*.
10. D. M. Freeman, "Converting Pairing-Based Cryptosystems From Composite-Order Groups to Prime-Order Groups," *Eurocrypt 2010*.
11. D. Freeman, M. Scott, and E. Teske, "A Taxonomy of Pairing-Friendly Elliptic Curves," *Journal of Cryptology* **23**:2 (Apr 2010). **700+ citations**.
12. D. Boneh, D. Freeman, J. Katz, and B. Waters, "Signing a Linear Subspace: Signature Schemes for Network Coding," *PKC 2009*. **Winner of 2025 PKC Test-of-Time Award**.

Full list of publications available at <http://cs.stanford.edu/~dfreeman>.