Georgia Essig

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Education

Oxford Internet Institute, University of Oxford, Oxford, UK *November 2026*
- Master of Science, Social Science of the Internet
- Thesis: "Estimating the Environmental Impacts of Large Language Model Usage in UK Higher Education," supervised by Dr. Ana Valdivia

Columbia College, Columbia University, New York, NY *May 2020*
- Bachelor of Arts, Major: Computer Science, Concentration: Russian Language & Culture
- Valedictorian of graduating class
- Junior Phi Beta Kappa, awarded to the top 2% of graduating seniors

Research Experience

Research Assistant, Ada Lovelace Institute, London, UK *October 2026–Present*
- Provide research support across a range of data and AI ethics-related projects, focusing on tools, methods, and governance needed to address societal risks arising from application of AI. Improve the robustness of metrics and methods used for the socio-technical evaluation of AI systems.
- Support drafting and editing of papers, reports, blogs and other resources.

Research Assistant, University of Oxford, Oxford, UK *July 2026–October 2026*
- Assisted in research design, data analysis, and programming of a computational simulation framework that estimates carbon emissions of generative AI usage across UK universities.
- This work included analysis and write-up of results, presentation of research in seminars, and preparation of a peer-reviewed publication.

Research Assistant, Columbia University, New York, NY *September 2019–May 2020*
- Built a technical solution to the problem of undercount in the 2020 Census, directly impacting equitable resource allocation and fair political representation by identifying communities at high risk of being undercounted. Received the National Conference on Citizenship grant.
- Built a Bayesian predictive model using PyMC to project daily response rates from 2010 data. Used Python and Flask to create a REST API to serve predicted count rates.

Research Assistant, Columbia Networks Lab, New York, NY *January 2019–December 2019*
- Developed methodologies such as analyzing traceroutes to determine the ability of Wide Area Networks to reduce latency and improve network connectivity compared to traditional routing practices. This improved knowledge of private cloud providers' offerings as opposed to the public internet, highlighting the implications of Internet privatization.
- Co-authored a paper that was presented at INFOCOM 2020.

Professional Experience

Software Engineer, AI-Powered Google, Google, New York, NY *November 2023–September 2025*
- Implemented quality improvements for an internal AI agent utilizing model fine-tuning, prompt experimentation, and output validation steps like LLM-as-a-judge, which improved the agent's quality by approximately 15% (F1 score).

- Integrated evaluation best practices by migrating to a new golden data storage system, improving reliability of the evaluation framework, and implementing new evaluation metrics. This work led to improved quality standards across workflows.
- Developed a novel service for evaluating agents that were built using a new internal agent building framework, enabling developers to run evaluations with low startup costs. Designed and implemented a C++ backend service with a Spanner database and a gRPC scheduler service, and worked with a small team to define and implement evaluation metrics.

Software Engineer, Device Trust, Google, New York, NY *May 2021–November 2023*

- Worked on the Python API that allows security engineers to set the trust level of Google devices. Designed and implemented a new API structure for grace period flexibility, graceful tier degradation, device resolution weighting, and led the migration to a continuous data freshness job. This enabled fine-grained grace periods, reduced processing load, and improved user resolutions.
- Optimized internal Go website for debugging device trust issues. This included refactoring and new functionality, integrating with an adjacent team, experimenting with UI changes, and implementing Google Analytics 4. These changes led to expanded and improved user resolutions, better user experience based on UX studies, and user engagement tracking.

Software Engineer, 20% Projects, Google, New York, NY *May 2021–September 2024 (Concurrent)*

- Implemented a landing page for the SCAN COVID-19 data representation project.
- Part-time contributor to Project Shield.

Software Engineer, Site Reliability, YouTube, San Bruno, CA *August 2020–May 2021*

- Developed tools to build and run large-scale systems scalably, reliably, and efficiently. This included implementing monitoring infrastructure and a new C++ module to block abusive clients, and participating in an on-call rotation that included managing load shedding, Borg jobs, cell footprints, and Global Service Load Balancer (GSLB) configurations.

Teaching Assistant, Columbia CS Department, New York, NY *January 2018–May 2020*

- Served as Head TA and TA for Introduction to Programming in Java, Data Structures in Java, and Computer Networks; TA for Discrete Mathematics and Modern iOS Application Development.

Software Engineering Intern, Capital One, New York, NY *June 2019–August 2019*

- Built frontend for an internal data visualization tool in React.js that improved director and manager engagement with reports.

Teaching Assistant, Girls Who Code, New York, NY *June 2018–August 2018*

- Taught lessons for the Girls Who Code summer course on a range of computer science topics, resulting in a group of around fifteen young women becoming interested in computer science.

Publications

- Arnold, T., Gürmeriçliler, E., **Essig, G.**, Gupta, A., Calder, M., Giotsas, V., & Katz-Bassett, E. (2020). (How much) does a private WAN improve cloud performance? In *IEEE INFOCOM 2020 - IEEE Conference on Computer Communications* (pp. 79–88). IEEE.

Technical and Other Skills

Programming Languages, Frameworks & Libraries: Python, C++, Go, Java, R, pandas, PyMC, TensorFlow
Distributed Systems: Borg, Spanner, Colossus (GFS), Flume, Stubby (gRPC)
Spoken Languages: Russian (intermediate), French (basic)