José Pablo Cambronero

Overview

(As of November 26, 2025) I'm a researcher working on using machine learning for code to develop state-of-the-art AI-assisted developer tools to make writing, fixing, and using software easier and more enjoyable.

Education

Academic Qualifications

2016-2021 **PhD in Computer Science**
Massachusetts Institute of Technology, Cambridge, MA

2013-2016 **Masters in Computer Science**
New York University: Courant Institute of Mathematical Sciences, NY, NY
GPA: 3.89, MS Research/Thesis Fellowship Award Fall 2015, funding work on A2Q (an order-aware optimizing query compiler for AQuery)

2007-2011 **Bachelor of Arts in Economics and Minor in German Studies**
University of Pennsylvania, Philadelphia, PA
GPA: 3.93, Phi Beta Kappa, Summa Cum Laude, Dean's List (08, 09, 10)

Industry Work Experience

07/2024 – current **Staff Software Engineer** *DevAI Team*, Google, Atlanta, GA
- Part of the DevAI research team, working on state-of-the-art machine-learning-based developer tooling. Currently focused on agentic software engineering, with applications to automated program repair and test generation. Our work is shipped internally at Google and we share our lessons externally through research papers at top SE venues.

06/2022 – 05/2024 **Senior Researcher** *PROSE Team*, Microsoft, Remote

06/2021 – 06/2022 **Researcher** *PROSE Team*, Microsoft, Remote
- Working on program synthesis technologies for a variety of developer, data scientist, and end-user applications. A lot of my work focuses on developing and applying large language models to programming tasks, such as program repair and natural language to code synthesis. As part of my job, I also manage and mentor junior researchers through the PROSE research fellowship program.

Summer 2020 **Intern** *Facebook AI Research*, Facebook, Remote
- Worked with the SysML team at FAIR on a novel tensor compiler, writing C++ for JIT compilation, benchmarking against Halide/TVM

Fall 2018 **Part-Time Research Visitor** *Big Code Team*, Facebook, Remote
- Applied deep learning to identify and highlight core code functionality in early ML4Code models.

Summer 2018 **Intern** *Software Engineering*, Facebook, Boston
- Applied deep learning to code search and contributed to some of the earliest ML4Code models in this space.

Summer 2015 **Intern** *Data Science*, Cloudera, San Francisco

2011 – 2014	**Full-Time Securitized Credit Research Associate** *Non-Agency Mortgages and US Housing*, Morgan Stanley, New York
Summer 2010	**Richard B. Fisher Scholar** *Fixed Income Generalist Sales and Fixed Income Credit Strategy*, Morgan Stanley, New York
Summer 2009	**Douglas Paul Scholar** *Investment Banking and Alternative Investments*, Morgan Stanley, New York

Academic Work Experience

Fall and Spring 2021	**Advanced Undergraduate Research Class** *TA*, MIT
2015 – 2016	**Graduate Course in Compiler Construction** *Grader*, NYU
Fall 2014	**Graduate Course in Programming Languages** *Teaching Assistant*, NYU

Language skills

- **Programming Languages:** Proficient in: Python, Javascript/Typescript, R, C#.

- **Natural Languages:** Native fluency in English and Spanish. Working proficiency in German.

Service

- **Program Committee: ASE 2025, ICSE SEIP 2025, DL4C@NeurIPS 2025, OOPSLA 2026**
- **Program Committee ICSE 2024**
- **Program Committee Table Representation Learning Workshop (at NeurIPS) 2023**
- **Program Committee Table Representation Learning Workshop (at NeurIPS) 2022**
- **Artifact Evaluation Committee OOPSLA 2020**
- **Artifact Evaluation Committee CAV 2020**
- **Artifact Evaluation Committee PPoPP 2018**

Mentoring/Advising

- Jennifer McCleary (MIT) MEng Thesis: pancreatic cancer risk modeling (Fall 2019 - January 2020)
- Alex Berg (MIT) Undergraduate research: pancreatic cancer risk modeling (Summer 2020)
- Thomas Xiong (MIT) MEng Thesis: pancreatic cancer risk modeling (Fall 2020 - Spring 2021)
- Lori Zhang (MIT) Undergraduate research: pancreatic cancer risk modeling (Summer 2020 - Spring 2021)
- Harshit Joshi (Microsoft): PROSE Research fellow, automated program repair (Fall 2021 to July 2023 – joining Stanford PhD program 2023)
- Mukul Singh (Microsoft): PROSE Research fellow, NL-to-Code (Spring 2022 to date)
- Abishai Ebenezer (Microsoft): PROSE Research fellow, automated program repair (Fall 2022 to July 2023)
- Jialu Zhang (Yale/Microsoft): Summer intern in the PROSE team, working on automated program repair (Summer 2022). Part of thesis committee.

Publications

[1] J. Zhang, J. Gu, W. Zhang, J. P. Cambronero, J. Kolesar, R. Piskac, D. Li, and H. Shi. A systematic study of time limit exceeded errors in online programming assignments. *arXiv preprint arXiv:2510.14339 (under submission)*, 2025.

[2] M. Singh, J. Cambronero, S. Gulwani, V. Le, C. Negreanu, and G. Verbruggen. Datavinci: Learning syntactic and semantic string repairs. *SIGMOD 2025*, 2025.

[3] S. Shi, R. Wei, M. Tufano, J. Cambronero, R. Cheng, F. Ivančić, and P. Rondon. Towards a human-in-

the-loop framework for reliable patch evaluation using an llm-as-a-judge. *arXiv preprint arXiv:2511.10865 (to appear at AI-SQE workshop at ICSE 2026)*, 2025.

[4]   P. Rondon, R. Wei, J. Cambronero, J. Cito, A. Sun, S. Sanyam, M. Tufano, and S. Chandra. Evaluating agent-based program repair at google. *arXiv preprint arXiv:2501.07531 (ICSE SEIP 2025)*, 2025.

[5]   V. Nguyen, G. Herzog, J. Cambronero, M. Revaj, A. Kini, A. Frömmgen, and M. Tabachnyk. Smart paste: Automatically fixing copy/paste for google developers. *arXiv preprint arXiv:2510.03843 (under submission)*, 2025.

[6]   J. Cambronero, M. Tufano, S. Shi, R. Wei, G. Uy, R. Cheng, C.-J. Liu, S. Pan, S. Chandra, and P. Rondon. Abstain and validate: A dual-llm policy for reducing noise in agentic program repair. *arXiv preprint arXiv:2510.03217 (under submission)*, 2025.

[7]   U. Singh, J. Cambronero, S. Gulwani, A. Kanade, A. Khatry, V. Le, M. Singh, and G. Verbruggen. An empirical study of validating synthetic data for formula generation. *arXiv preprint arXiv:2407.10657 (NAACL Findings 2025)*, 2024.

[8]   H. Dong, J. Zhao, Y. Tian, J. Xiong, M. Zhou, Y. Lin, J. Cambronero, Y. He, S. Han, and D. Zhang. Encoding spreadsheets for large language models. In Y. Al-Onaizan, M. Bansal, and Y.-N. Chen, editors, *Proceedings of the 2024 Conference on Empirical Methods in Natural Language Processing*, pages 20728–20748, Miami, Florida, USA, Nov. 2024. Association for Computational Linguistics.

[9]   S. Barke, C. Poelitz, C. S. Negreanu, B. Zorn, J. Cambronero, A. D. Gordon, V. Le, E. Nouri, N. Polikarpova, A. Sarkar, et al. Solving data-centric tasks using large language models. *NAACL 2024*, 2024.

[10]   A. Singha, J. Cambronero, S. Gulwani, V. Le, and C. Parnin. Tabular representation, noisy operators, and impacts on table structure understanding tasks in llms. *arXiv preprint arXiv:2310.10358 (Table Representation Learning at NeurIPS 2023)*, 2023.

[11]   M. Singh, J. C. Sánchez, S. Gulwani, V. Le, C. Negreanu, M. Raza, and G. Verbruggen. Cornet: Learning table formatting rules by example. *Proc. VLDB Endow.*, 16(10):2632–2644, jun 2023.

[12]   M. Singh, J. Cambronero, S. Gulwani, V. Le, and G. Verbruggen. Emfore: Online learning of email folder classification rules. In *Proceedings of the 32nd ACM International Conference on Information and Knowledge Management*, CIKM '23, page 2280–2290, New York, NY, USA, 2023. Association for Computing Machinery.

[13]   M. Singh, J. Cambronero, S. Gulwani, V. Le, C. Negreanu, and G. Verbruggen. CodeFusion: A pre-trained diffusion model for code generation. In H. Bouamor, J. Pino, and K. Bali, editors, *Proceedings of the 2023 Conference on Empirical Methods in Natural Language Processing*, pages 11697–11708, Singapore, Dec. 2023. Association for Computational Linguistics.

[14]   M. Singh, J. Cambronero, S. Gulwani, V. Le, C. Negreanu, E. Nouri, M. Raza, and G. Verbruggen. Format5: Abstention and examples for conditional table formatting with natural language. *VLDB 2024*, 2023.

[15]   T. Phung, V.-A. Pădurean, J. Cambronero, S. Gulwani, T. Kohn, R. Majumdar, A. Singla, and G. Soares. Generative ai for programming education: Benchmarking chatgpt, gpt-4, and human tutors. In *Proceedings of the 2023 ACM Conference on International Computing Education Research - Volume 2*, ICER '23, page 41–42, New York, NY, USA, 2023. Association for Computing Machinery.

[16]   T. Phung, J. Cambronero, S. Gulwani, T. Kohn, R. Majumdar, A. Singla, and G. Soares. Generating high-precision feedback for programming syntax errors using large language models. *EDM 2023*, 2023.

[17]   H. Joshi, J. C. Sanchez, S. Gulwani, V. Le, I. Radiček, and G. Verbruggen. Repair is nearly generation: Multilingual program repair with llms. In *Proceedings of the Thirty-Seventh AAAI Conference on Artificial Intelligence and Thirty-Fifth Conference on Innovative Applications of Artificial Intelligence and Thirteenth*

Symposium on Educational Advances in Artificial Intelligence, AAAI'23/IAAI'23/EAAI'23. AAAI Press, 2023.

[18] H. Joshi, A. Ebenezer, J. Cambronero, S. Gulwani, A. Kanade, V. Le, I. Radiček, and G. Verbruggen. Flame: A small language model for spreadsheet formulas. *arXiv preprint arXiv:2301.13779 (AAAI 2024)*, 2023.

[19] A. D. Gordon, C. Negreanu, J. Cambronero, R. Chakravarthy, I. Drosos, H. Fang, B. Mitra, H. Richardson, A. Sarkar, S. Simmons, et al. Co-audit: tools to help humans double-check ai-generated content. *arXiv preprint arXiv:2310.01297 (PLATEAU 2024)*, 2023.

[20] J. Cambronero, S. Gulwani, V. Le, D. Perelman, A. Radhakrishna, C. Simon, and A. Tiwari. Flashfill++: Scaling programming by example by cutting to the chase. *Proceedings of the ACM on Programming Languages*, 7(POPL):952–981, 2023.

[21] J. Zhang, J. Cambronero, S. Gulwani, V. Le, R. Piskac, G. Soares, and G. Verbruggen. Repairing bugs in python assignments using large language models. *OOPSLA 2024*, 2022.

[22] B. Wasti, J. P. Cambronero, B. Steiner, H. Leather, and A. Zlateski. Loopstack: a lightweight tensor algebra compiler stack. *arXiv preprint arXiv:2205.00618*, 2022.

[23] R. Bavishi, H. Joshi, J. Cambronero, A. Fariha, S. Gulwani, V. Le, I. Radiček, and A. Tiwari. Neurosymbolic repair for low-code formula languages. *Proc. ACM Program. Lang.*, 6(OOPSLA2), oct 2022.

[24] F. Zogaj, J. P. Cambronero, M. C. Rinard, and J. Cito. Doing more with less: characterizing dataset downsampling for automl. *Proceedings of the VLDB Endowment*, 14(11):2059–2072, 2021.

[25] M. Samak, J. P. Cambronero, and M. C. Rinard. Searching for replacement classes. *arXiv preprint arXiv:2110.05638*, 2021.

[26] T. H. Dang, J. P. Cambronero, and M. C. Rinard. Inferring drop-in binary parsers from program executions. *arXiv preprint arXiv:2104.09669*, 2021.

[27] L. Appelbaum, A. Berg, J. P. Cambronero, T. H. Y. Dang, C. C. Jin, L. Zhang, S. Kundrot, M. Palchuk, L. A. Evans, I. D. Kaplan, et al. Development of a pancreatic cancer prediction model using a multinational medical records database., 2021.

[28] J. P. Cambronero, J. Cito, and M. C. Rinard. Ams: generating automl search spaces from weak specifications. In *Proceedings of the 28th ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering*, pages 763–774, 2020.

[29] L. Appelbaum, J. P. Cambronero, J. P. Stevens, S. Horng, K. Pollick, G. Silva, S. Haneuse, G. Piatkowski, N. Benhaga, S. Duey, et al. Development and validation of a pancreatic cancer risk model for the general population using electronic health records: An observational study. *European Journal of Cancer*, 143:19–30, 2020.

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[32] J. P. Cambronero and M. C. Rinard. Al: autogenerating supervised learning programs. *Proceedings of the ACM on Programming Languages*, 3(OOPSLA):1–28, 2019.

[33] J. P. Cambronero, T. H. Dang, N. Vasilakis, J. Shen, J. Wu, and M. C. Rinard. Active learning for software engineering. In *Proceedings of the 2019 ACM SIGPLAN International Symposium on New Ideas, New Paradigms, and Reflections on Programming and Software*, pages 62–78, 2019.

[34] J. Cambronero, H. Li, S. Kim, K. Sen, and S. Chandra. When deep learning met code search. In *Proceedings of the 2019 27th ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering*, pages 964–974, 2019.

[35] J. Cambronero, P. Stanley-Marbell, and M. Rinard. Incremental color quantization for color-vision-deficient observers using mobile gaming data. *arXiv preprint arXiv:1803.08420*, 2018.

[36] J. Cambronero, J. K. Feser, M. J. Smith, and S. Madden. Query optimization for dynamic imputation. *Proceedings of the VLDB Endowment*, 10(11):1310–1321, 2017.