Cyrus Omar

Computer Science and Engineering
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Citizenship: USA

Employment

University of Michigan

Assistant Professor (Sep. 2019-present)

Future of Programming Lab (FP Lab)

Computer Science and Engineering (CSE) Division

Electrical Engineering and Computer Science (EECS) Department

College of Engineering (CoE)

University of Chicago

Postdoctoral Scholar (Sep. 2017-Aug. 2019)

Department of Computer Science
Supervisor: Ravi Chugh

Carnegie Mellon University

Postdoctoral Scholar (May. 2017-Aug. 2017)

Computer Science Department
Supervisor: Jonathan Aldrich

Education

Carnegie Mellon University

Ph.D. in Computer Science (Oct. 2010-May 2017)

Thesis: *Reasonably Programmable Syntax*
Advisor: Jonathan Aldrich

Center for the Neural Basis of Cognition

Graduate Training Program Certificate (Oct. 2010-May 2017)
PhD Program in Neural Computation (Aug. 2008-Oct. 2010)

University of Illinois at Urbana-Champaign

B.S. in Computer Science, 2008

B.S. in Molecular & Cellular Biology, 2008

Internships

Los Alamos National Lab

Synthetic Visual Cognition Group (May 2010-August 2010)

Supervisor: Garrett Kenyon

Individual Awards

1. NSF CAREER Award

2. Alan J. Perlis SCS Graduate Teaching Award

3. DOE Computational Science Graduate Fellowship

4. NSF Graduate Research Fellowship

5. Inductee, University of Illinois Bronze Tablet

Research Papers

Primary Research Area: programming languages
Secondary Research Areas: human-computer interaction, learning technology, artificial intelligence
† = advised during paper preparation

POPL 2024 Total Type Error Localization and Recovery with Holes

E. Zhao†, R. Maroof†, A. Dukkipati†, A. Blinn†, Z. Pan†, <u>C. Omar</u>

Proc. ACM Program. Lang, Issue: POPL 2024

OOPSLA 2023 Live Pattern Matching with Typed Holes

Y. Yuan†, S. Guest†, E. Griffis†, H. Potter†, D. Moon†, <u>C. Omar</u>

Proc. ACM Program. Lang., Issue: OOPSLA 2023

Distinguished Paper Award

VL/HCC 2023 Gradual Structure Editing with Obligations

D. Moon†, A. Blinn†, <u>C. Omar</u>

IEEE Symposium on Visual Languages and Human-Centered Computing

Onward! 2022 Contextualized Programming Language Documentation

H. Potter†, A. Madadi, R. Just, <u>C. Omar</u>

Proceedings of the 2022 ACM SIGPLAN International Symposium on New Ideas, New Paradigms, and Reflections on Programming and Software

VL/HCC 2022 RustViz: Interactively Visualizing Ownership and Borrowing

M. Almeida†, G. Cole†, K. Du†, G. Luo†, S. Pan†, Y. Pan†, K. Qiu†, V. Reddy†, H. Zhang†, Y. Zhu†, <u>C. Omar</u>

IEEE Symposium on Visual Languages and Human-Centered Computing

VL/HCC 2022 An Integrative Human-Centered Architecture for Interactive Programming Assistants

A. Blinn†, D. Moon†, E. Griffis†, <u>C. Omar</u>

IEEE Symposium on Visual Languages and Human-Centered Computing

PLDI 2021 Filling Typed Holes with Live GUIs

<u>C. Omar</u>, D. Moon[†], A. Blinn[†], I. Voysey, N. Collins, and R. Chugh

42nd ACM SIGPLAN International Conference on Programming Language Design and Implementation

HATRA 2020 Hazel Tutor: Guiding Novices Through Type-Driven Development

H. Potter[†] and <u>C. Omar</u>

1st Workshop on Human Aspects of Types and Reasoning Assistants

ICFP 2020 Program Sketching with Live Bidirectional Evaluation

J. Lubin, N. Collins, <u>C. Omar</u>, and R. Chugh

Proc. ACM Program. Lang., Issue: ICFP 2020

POPL 2019 Live Functional Programming with Typed Holes

<u>C. Omar</u>, I. Voysey, R. Chugh and M. Hammer

Proc. ACM Program. Lang., Issue: POPL 2019

ICFP 2018 Reasonably Programmable Literal Notation

<u>C. Omar</u> and J. Aldrich

Proc. ACM Program. Lang., Issue: ICFP 2018

SNAPL 2018 Toward Semantic Foundations for Program Editors

<u>C. Omar</u>, I. Voysey, M. Hilton, J. Sunshine, C. Le Goues, J. Aldrich and M. Hammer

2nd Symposium on Advances in Programming Languages

POPL 2017 Hazelnut: A Bidirectionally Typed Structure Editor Calculus

<u>C. Omar</u>, I. Voysey, M. Hilton, J. Aldrich and M. Hammer

44th ACM SIGPLAN Symposium on Principles of Programming Languages

GPCE 2016 Programmable Semantic Fragments: The Design and Implementation of typy

<u>C. Omar</u> and J. Aldrich.

15th ACM SIGPLAN International Conference on Generative Programming: Concepts & Experiences

SAC 2015 Composable and Hygienic Typed Syntax Macros

<u>C. Omar</u>, C. Wang and J. Aldrich

30th ACM Symposium on Applied Computing

ECOOP 2014 Safely Composable Type-Specific Languages

<u>C. Omar</u>, D. Kurilova, L. Nistor, B. Chung, A. Potanin and J. Aldrich.

28th European Conference on Object-Oriented Programming

Distinguished Paper Award

PSP 2014 Statically Typed String Sanitation Inside a Python

N. Fulton, <u>C. Omar</u> and J. Aldrich

1st International Workshop on Privacy and Security in Programming **(PSP 2014)**

Best Paper Award

ICSE 2014 Collaborative Infrastructure for Test-Driven Scientific Model Validation

<u>C. Omar</u>, J. Aldrich and R. Gerkin

47th International Conference on Software Engineering

New Ideas & Emerging Results Track (18% acceptance rate)

IWACO 2014 Language-Based Architectural Control

J. Aldrich, <u>C. Omar</u>, A. Potanin and D. Li

6th International Workshop on Aliasing, Capabilities and Ownership

GlobalDSL 2013 Type-Directed, Whitespace-Delimited Parsing for Embedded DSLs

<u>C. Omar</u>, B. Chung, D. Kurilova, A. Potanin and J. Aldrich

2013 International Workshop on the Globalization of Domain-Specific Languages

ICSE 2012 Active Code Completion.

<u>C. Omar</u>, Y. Yoon, T. D. LaToza and B. A. Myers

45th International Conference on Software Engineering

J. Neuro. 2012 Neural correlation is stimulus modulated by feedforward inhibitory circuitry

J. W. Middleton, <u>C. Omar</u>, B. Doiron and D. J. Simons

Journal of Neuroscience 32(2):506–18

IJHCI 2011 A Feedback Information-Theoretic Approach to the Design of Brain-Computer Interfaces.

<u>C. Omar</u>, A. Akce, M. Johnson, T. Bretl, R. Ma, E. Maclin, M. McCormick and T. Coleman

International Journal of Human-Computer Interaction, 27:1, 5–23

ACC 2008 Policies for neural prosthetic control: initial experiments with a text interface

<u>C. Omar</u>, M. Johnson, T. Bretl and T. Coleman

2008 American Control Conference

ICASSP 2008 Querying the user properly for high-performance brain machine interfaces: recursive estimation, control and feedback information theoretic perspectives

<u>C. Omar</u>, M. Johnson, T. Bretl and T. Coleman

2008 IEEE International Conference on Acoustics, Speech, and Signal Processing

IJCNN 2008 Shedding the weights: more with less

T. Achler, <u>C. Omar</u> and E. Amir

2008 International Joint Conference on Neural Networks

Selected Talks

1. Invited talk, University of Washington, Sep 2023

2. Invited talk, IFIP Working Group 2.3 (Language Design), Jan 2023

3. Invited talk, Ink & Switch, May 2022

4. Invited talk, University of Toledo, Feb 2022

5. Invited talk, University of Washington, December 2021

6. Invited talk, Strumenta Community, December 2021

7. Invited talk, UC Berkeley, October 2021

8. Invited talk, UC San Diego, Summer 2021

9. Invited talk, Hackworth Ltd., Summer 2021

10. Invited talk, Webflow, Summer 2021

11. Invited Talk, PPIG 2020

12. Accepted talk, Midwest PL Summit 2019

13. Accepted talk, TyDe 2019

14. Invited talk, Chicago Functional Programming Meetup + Reason Meetup (joint talk), 2018

15. Accepted talk, LIVE 2018

16. Accepted talk, META 2018

17. Invited talk, CMU Principles of Programming Seminar, 2018

18. Accepted talk, Strange Loop, 2018

19. Invited talk, Ink & Switch, 2018

20. Invited talk, Purdue University, 2017

21. Invited talk, TU Darmstadt, 2017

22. Accepted talk, LIVE 2017

23. Invited talk, HARC (Y Combinator Research), 2016

Teaching

University of Michigan

EECS 490: Programming Languages

Winter 2020, Fall 2020, Winter 2021, Fall 2021, Winter 2022, Fall 2022, Winter 2023, Fall 2023, Winter 2024

EECS 598-015: User Interfaces for Programming Languages

Fall 2019

Carnegie Mellon University

15-312: Principles of Programming Languages

Spring 2013, Head TA, with Prof. Robert Harper

15-150: Functional Programming

Fall 2011, Head TA, with Prof. Dan Licata

Advising

University of Michigan

Postdocs and Research Scientists (advising period; subsequent placement)

1. Michael D. Adams (Fall 2019-Winter 2021; Assistant Professor at Yale-NUS)

PhD Students (advised)

1. Matthew Keenan (Fall 2023-present)

2. Andrew Blinn (Fall 2020-present)

3. Eric Griffis (Fall 2020-Summer 2022)

4. David Moon (Fall 2019-present)

PhD Students (committee membership)

1. Xiaoying Pu (CSE, 2022)
2. April Wang (School of Information, 2023)

Masters Students

1. Karan Anand (Summer 2023-present)
2. Junwei Zhou (Winter 2023-present)
3. Matthew Ruiz (Winter 2023-present)
4. Alan Yang (Winter 2023-present)
5. Jonathan Lam (MS student at Cooper Union, Fall 2021-Summer 2022; industry position)
6. Priya Thanneermalai (Summer 2021-Fall 2021; industry position)
7. Soo Yeon (Sean) Lee (Winter 2020-Summer 2021; industry position)
8. Hannah Potter (Fall 2019-Summer 2021; PhD student at University of Washington)
9. Erin Deutschman (Winter 2020-Summer 2021; industry position)

Undergraduates (the following lists students who went on to PhD programs only)

1. Luoxi (Rosie) Meng (Winter 2022-Fall 2022; PhD student at UCSD)
2. Siyuan He (Winter 2020-Summer 2021; PhD student at Purdue University)
3. Yuning Wang (Winter 2020-Summer 2021; PhD student at Rutgers University)
4. Yongwei Yuan (Fall 2019-Summer 2020; PhD student at Purdue University)
5. Ke Du (Fall 2019-Summer 2020; PhD student at UIC)
... (80+ other undergraduate research students as of Aug 1, 2021, see lab website for full listing)

Prior to Faculty Position

Undergraduates (year; faculty advisor; subsequent placement)

1. Charles Chamberlain (2017-present; -; Jane Street Capital)
2. Andrew Benson (2016; Jonathan Aldrich; Facebook)
3. Chenglong Wang (2015; Jonathan Aldrich; PhD student, University of Washington)
4. Benjamin Chung (2014; Jonathan Aldrich; PhD student, Northeastern University)
5. Nathan Fulton (2012; Jonathan Aldrich; PhD student, Carnegie Mellon University)
6. Michael Rule (2009; Nathan Urban; PhD student, Brown University)

External Service

1. Program Committee, OOPSLA 2024
2. Program Committee, VL/HCC 2024
3. Panelist, NSF SHF Core Panel 2024
4. Steering Committee Co-chair, MWPLS 2024-2025
5. Co-founder and Steering Committee Member, Rust Edu working group, 2022-present
6. Reviewer, CHI 2024
7. Reviewer, Wiley Publishing 2023

8. Reviewer, ACM Transactions on Programming Languages and Systems (TOPLAS), 2023

9. Panelist, Programming Languages Mentoring Workshop (PLMW) at ICFP 2023

10. Program Committee, SPLASH-E 2023

11. Co-chair, Midwest PL Summit (MWPLS) 2023

12. Steering Committee Chair, TyDe (2022-2023)

13. Program Committee, PLDI 2023

14. Program Committee, ECOOP 2023

15. Program Committee, VL/HCC 2023

16. Program Committee, HATRA 2023

17. Program Committee, IFL 2023

18. Program Committee and Area Chair (Brave New Ideas and Pearls), ECOOP 2023

19. Panelist, NSF SHF Core Panel 2023

20. Panelist, European Research Council (ERC) 2023

21. External Reviewer, UIST 2023

22. Reviewer, MIT Press 2022

23. Mentor, PLMW at SPLASH 2022

24. Program Committee, IFL 2022

25. Program Committee, HATRA 2022

26. Program Committee, SPLASH Student Research Competition (SPLASH SRC) 2022

27. Program Committee, VL/HCC 2022

28. Program Committee, HATRA 2021

29. External Reviewer, UIST 2021

30. Program Committee, ICFP 2021

31. Program Committee, LIVE 2020

32. Program Committee, HATRA 2020

33. Co-Chair, Midwest PL Summit (MWPLS) 2020 [canceled due to COVID]

34. Co-Chair, Type-Driven Development (TyDe) workshop at ICFP 2020

35. External Review Committee, ICFP 2020

36. Student Research Competition Committee, ICFP 2020

37. Program Committee, HATRA 2020

38. Program Committee, Onward! Papers 2019

39. Program Committee, LIVE 2019

40. Program Committee, META 2019

41. Program Committee, ML Family Workshop 2019

42. Artifact Evaluation Committee, ICFP 2019

43. Program Committee, LIVE 2018

44. Program Committee, SPLASH Student Research Competition 2018

45. Referee, Journal of Visual Languages and Computing 2018

46. Program Committee, META 2017

47. Publicity Chair and Program Committee, GPCE 2017

48. Program Committee, DSLDI 2015

49. Artifact Evaluation Committee, ECOOP 2015

Internal Service

1. Member, CSE Diversity Committee, Fall 2019-present

   (a) External engagement (ongoing)

   (b) Coordinated engagement with MS Admissions (ongoing)

   (c) Led development of the CSE Departmental Broadening Participation in Computing (BPC) Plan

   (d) Participated in the development of the Summer 2020 Graduate Student Individual Check-In program

   (e) Wrote Faculty Recruiting section of DEI Committee Annual Report (each year)

2. Member, CSE Hosting Committee, Fall 2020-present

3. Organizer, CSE New Faculty Handbook project, Fall 2022-present

4. Organizer, MPLSE (Michigan PL + SE) Group, Fall 2019-present

5. Proposal Reviewer, Michigan Institute for Computational Discovery and Engineering (MICDE), 2023

6. Mentor, Girls Encoded / Explore CS Research program, Winter 2021

7. Mentor, African Undergraduate Research Adventure (AURA) program, Summer 2021

8. Mentor, Summer Undergraduate Research in Engineering (SURE) program, Summer 2020-2023

Funding

Michigan Engineering Seeding to Accelerate Research Themes (START):
Interactively Deriving Formal Proofs (2023-2024)

   Co-PI: Jean-Baptiste Jeannin

   Total: $30,000, My portion: $15,000

CSE Course Development Funding for EECS 490

   Total: $7,280

NSF support for Midwest Programming Languages Summit (2023-2026)

   Total: $15,000

Provost Early Tenure Track Faculty Research Support Initiative (2023)

   Total: $3,000

CAREER: Live and Direct Programming Environments (2023-2028)

   Total: $550,000

   NSF Cloudbank Supplement: $6,000

Infrastructure for Developing Interactive Rust Learning Material (2022-2023)

Futurewei via Portland State University (subcontract)

Total: $52,000

College of Engineering COVID Support Funding (2022)

Total: $50,000

NSF Small: Semantic Foundations for Hole-Driven Development (2018-2021)

Total: $500,000 / My portion: $192,635 (subcontract from CU Boulder)

Last updated: November 19, 2023