Cyrus Omar

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Education

Carnegie Mellon University

> Ph.D. in Computer Science (October 2010-May 2017)
>
>> Advisor: Jonathan Aldrich
>>
>> Thesis: *Reasonably Programmable Syntax*
>>
>> Thesis Committee: Jonathan Aldrich, Robert Harper, Karl Crary and Eric Van Wyk

University of Illinois at Urbana-Champaign

> B.S. in Computer Science, *summa cum laude*, 2008
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> B.S. in Molecular & Cellular Biology, *summa cum laude*, 2008
>
> GPA: 3.99 / 4.00

Internships

Los Alamos National Lab

> Synthetic Cognition Group (May-August 2010)
>
> Advisor: Garrett Kenyon

Fellowships & Individual Awards

1. Alan J. Perlis SCS Graduate Student Teaching Award
2. DOE Computational Science Graduate Fellowship
3. NSF Graduate Research Fellowship
4. Inductee, University of Illinois Bronze Tablet
5. Duncan H. Lawrie Leadership Award
6. Franz Hohn and J. P. Nash Scholarship

Research

Research Interests: Programming languages, intelligent and adaptable program editors, applied type theory

Peer-Reviewed Full Papers

1. 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 **(POPL 2017)**

2. 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 **(GPCE 2016)**

3. 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 **(ECOOP 2014)**

   Distinguished Paper Award

4. Active Code Completion.

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

   45th International Conference on Software Engineering **(ICSE 2012)**

5. 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 **(J. Neurosci. 2012)**

6. 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 **(IJHCI 2011)**

Peer-Reviewed Short Papers

7. 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 **(SNAPL 2017)**

8. Composable and Hygienic Typed Syntax Macros

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

   30th ACM Symposium on Applied Computing **(SAC 2015)**

9. 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

10. Collaborative Infrastructure for Test-Driven Scientific Model Validation

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

    47th International Conference on Software Engineering **(ICSE 2014)**

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

11. Language-Based Architectural Control

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

*6th International Workshop on Aliasing, Capabilities and Ownership **(IWACO 2014)***

12. 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 **(GlobalDSL 2013)***

13. 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 **(ACC 2008)***

14. 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 **(ICASSP 2008)***

15. Shedding the weights: more with less

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

    *2008 International Joint Conference on Neural Networks **(IJCNN 2008)***

Working Drafts

16. Reasonably Programmable Syntax

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

    Dissertation and accompanying journal paper in preparation

    2nd Place, ICFP 2015 Graduate Student Research Competition

17. Hazelnut Live: Semantic Foundations for Evaluating Incomplete Programs

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

18. Statistical Models of Typed Syntax Trees

    <u>C. Omar</u>, S. Joshi and F. Cruz

    3rd Place, SPLASH 2014 Graduate Student Research Competition

19. Tidy: A Modularly Programmable Bidirectionally Typed Translation Semantics

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

Selected Talks

1. Modularly Programmable Type Structure

   Invited talk, TU Darmstadt (scheduled January 2017)

2. Hazel: Semantic Foundations for Interactive Programming Tools

   Invited talk, HARC (Y Combinator Research), 2016

   IBM Programming Languages Day, 2016

3. Modular Syntax

   Parsing@SLE Workshop, 2015

4. Modularly Programmable Syntax and Type Structure

        CMU Principles of Programming Seminar, June 2015

5. Composable and Hygienic Typed Syntax Macros

        Domain-Specific Language Design and Implementation Workshop (DSLDI 2014)

6. Active Typechecking and Translation

        Domain-Specific Language Design and Implementation Workshop (DSLDI 2013)

        nVidia GPU Technology Conference 2013

7. Open Science

        Joint talk with Shreejoy Tripathy

        Center for the Neural Basis of Cognition Brain Bag

8. Sound, Usable and Flexible Foundations for Scientific and High-Performance Languages and Tools

        SIAM Conference on Parallel Processing for Scientific Computing (PP 2012)

9. End-User Programming by Scientists

        Lecture, Human Aspects of Software Development (Spring 2011)

10. How do people naturally think about computation?

        Lecture, Human Aspects of Software Development (Spring 2011)

Selected Press Coverage

1. GigaOm (Aug. 7, 2014)
2. Motherboard (Aug. 8, 2014)
3. ACM TechNews (Aug. 11, 2014)
4. Gizmodo (Aug. 11, 2014)
5. SD Times (Aug. 13, 2014)
6. ITBusinessEdge (Aug. 14, 2014)
7. The Tartan (Aug. 24, 2014)

Teaching

Carnegie Mellon University

Principles of Programming Languages (15-312)

    Head TA, Spring 2013 with Prof. R. Harper

Functional Programming (15-150)

    Head TA, Fall 2011 with Prof. D. Licata

Service

1. Program Committee, META 2017
2. Publicity Chair and Program Committee, GPCE 2017
3. Program Committee, DSLDI 2015

4. Artifact Evaluation Committee, ECOOP 2015

5. CSD Graduate Admissions Committee, 2013

6. CNBC Social Committee, 2011

Advising

Undergraduates (year; co-advisor; subsequent placement)

1. A. Benson (2016; Prof. J. Aldrich; Facebook)

2. C. Wang (2015; Prof. J. Aldrich; PhD student, University of Washington)

3. B. Chung (2014; Prof. J. Aldrich; PhD student, Northeastern University)

4. N. Fulton (2012; Prof. J. Aldrich; PhD student, Carnegie Mellon University)

5. M. Rule (2009; Prof. N. Urban; PhD student, Brown University)

Last updated: May 16, 2017