

# Cyrus Omar

Postdoctoral Scholar  
Department of Computer Science  
The University of Chicago  
5730 S Ellis Ave  
Chicago, IL 60637

Phone: (302) 743-1494  
Office: 291 Crerar Library  
Email: [cyrus.omar@gmail.com](mailto:cyrus.omar@gmail.com)  
Webpage: <http://people.cs.uchicago.edu/~comar>  
Citizenship: USA

## Employment

### *The University of Chicago*

Postdoctoral Scholar (September 2017-present)  
Department of Computer Science  
Advisor: Ravi Chugh

## 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  
Center for the Neural Basis of Cognition  
Graduate Training Program (October 2010-May 2017)  
PhD Program in Neural Computation (August 2008-October 2010)

### *University of Illinois at Urbana-Champaign*

B.S. in Computer Science, 2008  
B.S. in Molecular & Cellular Biology, 2008  
GPA: 3.99 / 4.00

## Internships

### *Los Alamos National Lab*

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

## Fellowships & Individual Awards

1. Alan J. Perlis SCS Graduate Teaching Award (1 per year across all CMU SCS departments)
2. DOE Computational Science Graduate Fellowship (4.5% acceptance rate)
3. NSF Graduate Research Fellowship (10% acceptance rate)
4. Inductee, University of Illinois Bronze Tablet (3% of UIUC graduating seniors)

## Research

*Primary Research Area:* programming languages

*Secondary Research Areas:* human-computer interaction, cybersecurity, software engineering, AI

### *Peer-Reviewed Full Papers*

1. Live Functional Programming with Typed Holes  
C. Omar, I. Voysey, R. Chugh and M. Hammer  
*Proc. ACM Program. Lang.* 3, POPL, Article 14 (**POPL 2019**)
2. Reasonably Programmable Literal Notation  
C. Omar and J. Aldrich  
*Proc. ACM Program. Lang.* 2, ICFP, Article 106 (**ICFP 2018**)
3. Hazelnut: A Bidirectionally Typed Structure Editor Calculus  
C. Omar, I. Voysey, M. Hilton, J. Aldrich and M. Hammer  
*44th ACM SIGPLAN Symposium on Principles of Programming Languages (POPL 2017)*
4. Programmable Semantic Fragments: The Design and Implementation of typy  
C. Omar and J. Aldrich.  
*15th ACM SIGPLAN International Conference on Generative Programming: Concepts & Experiences (GPCE 2016)*
5. Safely Composable Type-Specific Languages  
C. Omar, D. Kurilova, L. Nistor, B. Chung, A. Potanin and J. Aldrich.  
*28th European Conference on Object-Oriented Programming (ECOOP 2014)*  
**Distinguished Paper Award**
6. Statically Typed String Sanitation Inside a Python  
 N. Fulton, C. Omar and J. Aldrich  
*1st International Workshop on Privacy and Security in Programming (PSP 2014)*  
**Best Paper Award**
7. Active Code Completion.  
C. Omar, Y. Yoon, T. D. LaToza and B. A. Myers  
*45th International Conference on Software Engineering (ICSE 2012)*
8. Neural correlation is stimulus modulated by feedforward inhibitory circuitry  
 J. W. Middleton, C. Omar, B. Doiron and D. J. Simons  
*Journal of Neuroscience* 32(2):506–18 (**J. Neurosci.** 2012)
9. A Feedback Information-Theoretic Approach to the Design of Brain-Computer Interfaces.  
C. Omar, 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

10. Toward Semantic Foundations for Program Editors  
C. Omar, I. Voysey, M. Hilton, J. Sunshine, C. Le Goues, J. Aldrich and M. Hammer  
*2nd Symposium on Advances in Programming Languages (SNAPL 2017)*
11. Composable and Hygienic Typed Syntax Macros  
C. Omar, C. Wang and J. Aldrich  
*30th ACM Symposium on Applied Computing (SAC 2015)*
12. Collaborative Infrastructure for Test-Driven Scientific Model Validation  
C. Omar, J. Aldrich and R. Gerkin  
*47th International Conference on Software Engineering (ICSE 2014)*  
 New Ideas & Emerging Results Track (18% acceptance rate)
13. Language-Based Architectural Control  
 J. Aldrich, C. Omar, A. Potanin and D. Li  
*6th International Workshop on Aliasing, Capabilities and Ownership (IWACO 2014)*
14. Type-Directed, Whitespace-Delimited Parsing for Embedded DSLs  
C. Omar, B. Chung, D. Kurilova, A. Potanin and J. Aldrich  
*2013 International Workshop on the Globalization of Domain-Specific Languages (GlobalDSL 2013)*
15. Policies for neural prosthetic control: initial experiments with a text interface  
C. Omar, M. Johnson, T. Bretl and T. Coleman  
*2008 American Control Conference (ACC 2008)*
16. Querying the user properly for high-performance brain machine interfaces: recursive estimation, control and feedback information theoretic perspectives  
C. Omar, M. Johnson, T. Bretl and T. Coleman  
*2008 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2008)*
17. Shedding the weights: more with less  
 T. Achler, C. Omar and E. Amir  
*2008 International Joint Conference on Neural Networks (IJCNN 2008)*

### Selected Talks

1. Accepted talk, TyDe 2019
2. Invited talk, Chicago Functional Programming Meetup + Reason Meetup (joint talk), 2018
3. Accepted talk, LIVE 2018
4. Accepted talk, META 2018
5. Invited talk, CMU Principles of Programming Seminar, 2018
6. Accepted talk, Strange Loop, 2018
7. Invited talk, Ink & Switch, 2018
8. Invited talk, Purdue University, 2017
9. Invited talk, TU Darmstadt, 2017

10. Accepted talk, LIVE 2017
11. Invited talk, HARC (Y Combinator Research), 2016

## 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, Onward! Papers 2019
2. Program Committee, LIVE 2019
3. Program Committee, META 2019
4. Program Committee, ML Family Workshop 2019
5. Artifact Evaluation Committee, ICFP 2019
6. Program Committee, LIVE 2018
7. Program Committee, SPLASH Student Research Competition 2018
8. Referee, Journal of Visual Languages and Computing 2018
9. Program Committee, META 2017
10. Publicity Chair and Program Committee, GPCE 2017
11. Program Committee, DSLDI 2015
12. Artifact Evaluation Committee, ECOOP 2015
13. CMU CSD Graduate Admissions Committee, 2013
14. CMU CNBC Social Committee Chair, 2011

## Advising

### PhD Students (year; faculty advisor)

1. Nicholas Collins (2018-present; Ravi Chugh)
2. David Moon (2018-present; Matthew A. Hammer)

### Undergraduates (year; faculty advisor; subsequent placement)

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

## Grant Funding

NSF Small: Semantic Foundations for Hole-Driven Development (\$496,771, 2018-2021)

Lead Author and Key Personnel

PIs: Ravi Chugh and Matthew A. Hammer

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