

John Vilk

University of Massachusetts Amherst
College of Information and Computer Sciences
140 Governors Drive
Amherst, MA 01003

Phone: (508) 425-1787
Email: jvilk@cs.umass.edu
Homepage: <https://jvilk.com>

Research Interests

My research spans software systems, programming languages, and software engineering, with a focus on overcoming challenges posed by web application development.

Education

University of Massachusetts Amherst (Advised by Emery D. Berger)

Ph.D. in Computer Science	<i>Anticipated May, 2018</i>
M.S. in Computer Science	2014

Worcester Polytechnic Institute

B.S. in Computer Science; Minor: Math	May, 2011
---------------------------------------	-----------

Honors & Awards

Facebook Ph.D. Fellowship in Programming Languages & Compilers	2015-2017
---	-----------

SIGPLAN Research Highlight for DOPPIO: Breaking the Browser Language Barrier	2014
---	------

Distinguished Artifact Award for DOPPIO: Breaking the Browser Language Barrier	PLDI 2014
---	-----------

Inducted into WPI chapter, Upsilon Pi Epsilon computer science honor society	2011
---	------

Salisbury Prize Worcester Polytechnic Institute	2011
--	------

Awarded for completing all of my requirements at WPI “faithfully, industriously, and with distinguished attainment”.

Dr. Neil G. Sullivan Memorial Award Worcester Polytechnic Institute	2010
--	------

Awarded annually to three juniors in recognition of their demonstrated ability and promise.

Charles O’ Thompson Scholar Worcester Polytechnic Institute	2008
--	------

Recognizes outstanding performance by first-year students.

Travel Grants PLDI 2016 IEEE S&P 2015 OSDI 2014 PLDI 2014 POPL 2012

Publications

- ReJS: Time-Travel Debugging for Browser-Based Applications** *In Progress*
John Vilks, James Mickens, and Mark Marron MSR-TR-2016-7
- BLEAK: Automatically Debugging Memory Leaks in Web Applications** *In Submission*
John Vilks and Emery D. Berger (Preprint available on my website)
- BROWSIX: Bridging the Gap Between Unix and the Browser** ASPLOS 2017
Bobby Powers, John Vilks, Emery D. Berger
- SURROUNDWEB: Mitigating Privacy Concerns in a 3D Web Browser** IEEE S&P 2015
John Vilks, David Molnar, Eyal Ofek, Chris Rossbach, Benjamin Livshits, Alexander Moshchuk, Helen J. Wang, and Ran Gal
- DOPPIO: Breaking the Browser Language Barrier** PLDI 2014
John Vilks and Emery D. Berger *SIGPLAN Research Highlight*

Posters

- BROWSIX: Bridging the Gap Between Unix and the Browser** NSDI 2017
Bobby Powers, John Vilks, and Emery D. Berger
- BCoZ: Effective Performance Debugging for Web Applications** NENS 2016
John Vilks and Emery D. Berger, NENS 2016.
- TARDIS: Affordable Time-Travel Debugging in Managed Runtimes** OOPSLA 2014
Earl T. Barr, Mark Marron, and John Vilks

Talks

- BLEAK: Automatically Debugging Memory Leaks in Web Applications**
New England Networking and Systems Day, Boston, MA. December, 2017
Facebook Fellows Workshop, Menlo Park, CA. September, 2017
- BROWSIX: Bridging the Gap Between Unix and the Browser**
IBM Programming Languages Day, Yorktown Heights, NY. December, 2017
- BCoZ: Effective Performance Debugging for Web Applications**
PLDI 2016 - JSTools, Barcelona, Spain. June, 2017
- Making the Browser Reasonable for Sane Developers**
Northeastern University, Boston, MA. January, 2017
University of Pennsylvania, Philadelphia, PA. December, 2016

A Gray Box Approach For High-Fidelity High-Speed Time-Travel Debugging

Facebook Fellows Workshop, Menlo Park, CA.	June, 2016
End of Internship Talk at Microsoft Research, Redmond, WA.	August, 2014

SURROUNDWEB: Mitigating Privacy Concerns in a 3D Web Browser

IEEE Symposium on Security & Privacy, San Jose, CA.	May, 2015
End of Internship Talk at Microsoft Research, Redmond, WA.	August, 2013

DOPPIO: Breaking the Browser Language Barrier

Microsoft Research, Redmond, WA.	January, 2015
PLDI 2014, Edinburgh, UK.	June 2014
Harvard University, Cambridge, MA.	May, 2014

Employment

University of Massachusetts Amherst Research Assistant	2011 – present
<i>with Programming Languages and Systems at Massachusetts (PLASMA) group</i>	

University of Massachusetts Amherst Teaching Assistant	Spring 2016
<i>for CMPSCI 326: Web Programming, with Professor Timothy Richards</i>	

Microsoft Research Research Intern	Summer 2015, Summer 2014
<i>with James Mickens and Mark Marron in the Distributed Systems and Research in Software Engineering (RiSE) groups</i>	

Microsoft Research Research Intern	Summer 2013
<i>with David Molnar in the Security and Privacy Group</i>	

Google, Inc. Software Engineering Intern	Summer 2012
<i>with the Java Platform Team</i>	

MIT Lincoln Laboratory Research Intern	Summer 2011
<i>in Division 6: Communication Systems</i>	

SoftArtisans Inc. Software Engineering Intern	Summer 2010
--	-------------

Professional Service**External Review Committee Member**

ACM Conference on Programming Language Design and Implementation (PLDI17)	2017
ACM Conference on Programming Language Design and Implementation (PLDI16)	2016

Artifact Evaluation Committee Member

ACM Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA15)	2015
--	------

ACM Conference on Programming Language Design and Implementation (PLDI15)	2015
ACM Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA14)	2014

External Reviewer

USENIX Security Symposium	2014
ACM Object-Oriented Programming, Systems, Languages, and Applications (PLDI14)	2014
ACM Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA12)	2012
ACM SIGPLAN Workshop on Memory Systems Performance and Correctness (MSPC12)	2012
USENIX Workshop on Hot Topics in Parallelism (HotPar12)	2012

Student Volunteer

ACM Conference on Programming Language Design and Implementation (PLDI16)	2016
ACM Conference on Programming Language Design and Implementation PC Meeting	2016
ACM Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA14)	2014

Graduate Representative UMass Amherst College of Information and Computer Sciences 2014-2015

One of four Ph.D. students elected to serve for one year. Attended and voted during faculty meetings, met with faculty candidates, and organized department seminars

Patents

Protecting privacy in web-based immersive augmented reality Patent US 20150143459 A1

David Molnar, John Vilk, Eyal Ofek, Alexander Moshchuk, Jiahe Wang, *Granted 2015*
 Ran Gal, Lior Shapira, Douglas Christopher Burger, Blair MacIntyre,
 and Benjamin Livshits

Software

BLEAK Automatic memory leak debugger for web applications.

<https://github.com/plasma-umass/bleak>

BROWSIX Bridges the gap between Unix and the browser.

<https://browsix.org>

DOPPIO+DOPPIOJVM Breaks the browser language barrier and includes a plugin-free JVM.

<https://github.com/plasma-umass/doppio>

BrowserFS POSIX-like file system with numerous backends. Forms part of DOPPIO.

<https://github.com/jvilk/browserfs>

Teaching & Mentoring Experience

Guest Lecturer University of Massachusetts Amherst

COMPSCI 326: Web Programming (undergraduate)

Spring 2016

Teaching Assistant University of Massachusetts Amherst

COMPSCI 326: Web Programming

Spring 2016

As a TA, I co-taught the class with the instructor. I redesigned the curriculum, designed and wrote all of the assignments, graded assignments, held well-attended office hours, and answered hundreds of questions on Piazza.

Research Mentor

Muhammad Bhatti Undergraduate in Computer Science, NUST, Pakistan

Summer 2015

Remotely supervised contributions to a research project via Google Summer of Code. Extended an experimental Python implementation with multithreading support.

Giles Lavelle Undergraduate in Computer Science, University of Bristol

Summer 2013

Remotely supervised contributions to DOPPIO via Google Summer of Code. Extended DOPPIO's file system with cloud storage support.

Braden McDorman Undergraduate in Computer Science, Univ. of Oklahoma

Summer 2013

Remotely supervised contributions to DOPPIO via Google Summer of Code. Extended DOPPIO with support for outgoing TCP sockets.

Mentor Computing Beyond the Double Bind Mentoring Network

2015-2016

Provided remote guidance and support to undergraduate women of color in computer science.

References

Emery D. Berger (advisor)

Professor
University of Massachusetts Amherst
emery@cs.umass.edu
+1 (413) 577-4211

James Mickens

Associate Professor
Harvard University
mickens@g.harvard.edu
+1 (617) 384-8132

Yuriy Brun

Associate Professor
University of Massachusetts Amherst
brun@cs.umass.edu
+1 (413) 577-0233

Arjun Guha

Assistant Professor
University of Massachusetts Amherst
arjun@cs.umass.edu
+1 (413) 545-2447

Timothy Richards (Teaching Reference)

Senior Teaching Faculty & Undergraduate Program Director
University of Massachusetts Amherst
richards@cs.umass.edu
+1 (413) 545-4704