

# Arvind Satyanarayan

arvindsatya@mit.edu • <http://arvindsatya.com> • @arvindsatya1

## EDUCATION

---

- 2017 **Ph.D. Computer Science**, *Stanford University*  
*Thesis: Declarative Interaction Design for Data Visualization*  
*Advisor: Jeffrey Heer (University of Washington)*
- 2014 **M.S. Computer Science**, *Stanford University*
- 2011 **B.S. Computer Science with Honors**, *University of California, San Diego*  
*Thesis: Using Overlays to Support Collaborative Interaction with Display Walls*  
*Advisor: James D. Hollan*

## EMPLOYMENT

---

- July 2018 – Present **Assistant Professor**, *MIT EECS/CSAIL*.
- 2017 – 2018 **Postdoctoral Research Scientist**, *Google Brain Team*
- 2011 – 2017 **Graduate Research Assistant**, *Interactive Data Lab, Stanford Univ./Univ. of Washington*  
*With Prof. Jeffrey Heer*
- 2014 – 2016 **Co-Founder and Advisor**, *Apropose, Inc.*
- 2013 – 2014 **Co-Founder and Chief Architect**, *Apropose, Inc.*  
Led initial development of core infrastructure and prototype applications, culminating in a successful **\$1.9M seed round** backed by NEA and Andreessen Horowitz.
- Summer 2012 & Spring 2016 **Research Intern**, *In Situ Lab, INRIA and LRI, Université Paris-Sud*  
*With Profs. Wendy Mackay and Michel Beaudouin-Lafon*  
Developed a prototype visualization substrate to enable collaborative interactive visual analysis between multiple users using heterogeneous devices and a large display wall.
- 2011 – 2012 **Graduate Research Assistant**, *HCI Group, Stanford University*  
*With Prof. Scott Klemmer*
- 2010 – 2011 **Undergraduate Research Assistant**, *DCog-HCI Lab, UC San Diego*  
*With Prof. James Hollan*  
Developed HIPerFace: a Java framework to combine interactions from multiple individual input device into novel composite interactions.
- Summer 2008 **Movable Type Product Intern**, *Six Apart Ltd.*  
Developed an extensible revision history framework for Movable Type objects with a time-travel slider and `diff`-style interfaces.
- 2004 – 2007 **Publisher and Developer**, *Movalog and Movalog Plugins*  
<http://www.movalog.com>  
Developed several popular plugins for Movable Type. One plugin, CustomFields, was **acquired** by Six Apart and was distributed as part of the core Movable Type package.  
Co-organized The Style Contest, a design contest for Movable Type blog themes. Six Apart, Adobe, and StyleMaster sponsored over \$17,000 in prizes. Judges included Derek Powazek, Jason Santa Maria, and John Allsopp.

## PUBLICATIONS

---

- 2018 **Augmenting Code with In Situ Visualizations to Aid Program Understanding**  
Jane Hoffswell, Arvind Satyanarayan, Jeffrey Heer  
*Proc. ACM Human Factors in Computing Systems (CHI)*, April 2018  
[26% Acceptance Rate]
- The Building Blocks of Interpretability**  
Chris Olah, Arvind Satyanarayan, Ian Johnson, Shan Carter, Ludwig Schubert, Katherine Ye, Alexander Mordvintsev  
*Distill*, March 2018
- 2017 **Vega-Lite: A Grammar of Interactive Graphics**  
Arvind Satyanarayan, Dominik Moritz, Kanit Wongsuphasawat, Jeffrey Heer  
*IEEE Trans. Visualization & Computer Graphics (Proc. InfoVis '16)*, January 2017  
[22% Acceptance Rate, **Best Paper Award (Top 1)**]
- 2016 **Visual Debugging Techniques for Reactive Data Visualization**  
Jane Hoffswell, Arvind Satyanarayan, Jeffrey Heer  
*Computer Graphics Forum (Proc. EuroVis)*, June 2016  
[27% Acceptance Rate]
- Reactive Vega: A Streaming Dataflow Architecture for Declarative Interactive Visualization**  
Arvind Satyanarayan, Ryan Russell, Jane Hoffswell, Jeffrey Heer  
*IEEE Trans. Visualization & Computer Graphics (Proc. InfoVis '15)*, January 2016  
[22% Acceptance Rate]
- 2014 **Declarative Interaction Design for Data Visualization**  
Arvind Satyanarayan, Kanit Wongsuphasawat, Jeffrey Heer  
*Proc. ACM User Interface Software and Technology (UIST)*, October 2014  
[22% Acceptance Rate]
- Lyra: An Interactive Visualization Design Environment**  
Arvind Satyanarayan, Jeffrey Heer  
*Computer Graphics Forum (Proc. EuroVis)*, June 2014  
[25% Acceptance Rate]
- Authoring Narrative Visualizations with Ellipsis**  
Arvind Satyanarayan, Jeffrey Heer  
*Computer Graphics Forum (Proc. EuroVis)*, June 2014  
[25% Acceptance Rate]
- 2013 **Webzeitgeist: Design Mining the Web**  
Ranjitha Kumar, Arvind Satyanarayan, Cesar Torres, Maxine Lim, Salman Ahmad, Scott R. Klemmer, Jerry O. Talton  
*Proc. ACM Human Factors in Computing Systems (CHI)*, May 2013  
[20% Acceptance Rate, **Best Paper Award (Top 1%)**]
- 2012 **Using Overlays to Support Collaborative Interaction with Display Walls**  
Arvind Satyanarayan, Nadir Weibel, James D. Hollan  
*Proc. ACM Intelligent User Interfaces (IUI)*, February 2012  
[19% Acceptance Rate]

## POSTERS & TECHNICAL REPORTS

---

- 2013 **The CHI 2013 Interactive Schedule**  
 Arvind Satyanarayan, Daniel Strazzulla, Clemens Klokmoose, Michel Beaudouin-Lafon,  
 Wendy Mackay  
*Extended Abstracts, ACM Human Factors in Computing Systems (CHI), May 2013*
- 2012 **Learning Structural Semantics for the Web**  
 Maxine Lim, Ranjitha Kumar, Arvind Satyanarayan, Cesar Torres, Jerry O. Talton,  
 Scott R. Klemmer  
*Stanford CSTR 2012-03, December 2012*
- A Platform for Large-Scale Machine Learning on Web Design**  
 Arvind Satyanarayan, Maxine Lim, Scott R. Klemmer  
*Extended Abstracts, ACM Human Factors in Computing Systems (CHI), May 2012*

## INVITED TALKS & DEMOS

---

- May 2018 **The Building Blocks of Interpretability**  
 emlyon business school, *Lyon, France*
- April 2017 **Vega-Lite: A Grammar of Interactive Graphics**  
 OpenVis Conf, *Boston, MA*
- Declarative Interaction Design for Data Visualization**
- April 2017 Massachusetts Institute of Technology, *Computer Science, Cambridge, MA*  
 April 2017 New York University, *Tandon Computer Science & Center of Data Science, New York City, NY*  
 April 2017 University of California, San Diego, *Computer Science, San Diego, CA*  
 April 2017 Northwestern University, *Computer Science, Evanston, IL*  
 March 2017 University of British Columbia, *Computer Science, Vancouver, Canada*  
 March 2017 University of Toronto, *Computer Science, Toronto, Canada*  
 March 2017 University of Michigan, *Computer Science, Ann Arbor, MI*  
 February 2017 University of California, Berkeley, *Computer Science, Berkeley, CA*  
 February 2017 University of Illinois Urbana-Champaign, *Computer Science, Urbana, IL*  
 February 2017 Cornell University, *Computer Science & Information Science, Ithaca, NY*  
 February 2017 University of Wisconsin-Madison, *Computer Science, Madison, WI*
- October 2016 **The Vega Ecosystem**  
 Keynote Address, Visualization In Practice Workshop, *IEEE VIS, Baltimore, MD*
- Reactive Building Blocks: Interactive Visualizations with Vega**
- July 2016 Keynote Address, DataViz Camp, *United Nations*  
 April 2016 OpenVis Conf, *Boston, MA*
- Higher-Level Tools for Interactive Data Visualization**
- May 2016 INRIA Saclay, *Saclay, France*  
 September 2015 BiD Seminar, *UC Berkeley, Berkeley, CA*
- Lowering the Threshold of Visualization Design**
- April 2015 Linfield College, *Science Colloquium, McMinnville, OR*  
 December 2014 Tata Innovation Labs, *Tata Consultancy Services, Delhi, India*
- Designing Visualizations with Lyra Tutorial**
- April 2015 I247: Information Visualization & Presentation, *UC Berkeley Information School, Berkeley, CA*  
 December 2014 Tata Innovation Labs, *Tata Consultancy Services, Delhi, India*

- December 2014 J221: Introduction to Data Visualization, *UC Berkeley Journalism School, Berkeley, CA*  
 November 2014 HCDE 511: Information Visualization, *University of Washington, Seattle, WA*
- Lyra: An Interactive Visualization Design Environment**
- April 2014 OpenVis Conf, *Boston, MA*  
 March 2014 CAR, *Baltimore, MD*  
 February 2014 Tapestry, *Annapolis, MD*
- NewsCamp :: Introduction to D3**
- March 2014 CAR, *Baltimore, MD*

## TEACHING

---

- Winter 2016 **HCID 520: User Interface Software & Technology**, *University of Washington*  
 Co-Instructor with Prof. Jeffrey Heer
- Winter 2013 **CS 247: Human-Computer Interaction Design Studio**, *Stanford University*  
 Graduate Teaching Assistant for Profs. Jeffrey Heer and Michael Bernstein
- Fall 2012 **CS 147: Introduction to Human-Computer Interaction**, *Stanford University*  
 Graduate Teaching Assistant for Prof. Scott Klemmer
- Winter 2012 **HCI Online #001**, *Stanford University and Coursera*  
 Graduate Teaching Assistant for Prof. Scott Klemmer

## MENTORING

---

- Fall 2016 Tianyi "Tina" Lin, BS Computer Science & Engineering (UW '17)  
 Summer & Fall 2016 Matthew Chun, BS Computer Science & Engineering (UW '18)  
 Summer 2016 Yiyang "Amy" Xu, BS Computer Science & Engineering (UW '18)  
 Summer 2016 Anjir Hossain, BS Human-Centered Design & Engineering (UW '18)  
 Spring 2016 Nikhil Khanna, BS Computer Science & Engineering (UW '18)  
 2015 – 2016 Emily Gu, BS+MS Computer Science & Engineering (UW '16)  
 Summer 2015 Ruijia "Iris" Wang, BS Computer Science & Engineering (UW '17)  
 2014 – 2016 Ryan Russell, BS Computer Science & Engineering (UW '16)

## SERVICE

---

- Reviewing IEEE VIS 2014–2018, EuroVis 2014–2017, IEEE TVCG 2015–2018, ACM UIST 2014–2016, ACM CHI 2013–2018, ACM IUI 2012–2015, IEEE PacificVis 2016.  
**Recognition for exceptional reviews:** CHI 2017, VIS 2017.
- Diversity Committees IEEE VIS 2018. Information+ 2018.
- Program Committees OpenVis Conf 2016–2018. ACM CHI 2016 Late-Breaking Work. Information+ 2018.
- Editor Distill (<http://distill.pub>)
- 2018 Program Co-Chair, *OpenVis Conf*
- 2013 Interactive Schedule Chair, *CHI 2013 Organizing Committee*
- 2009 – 2011 Resident Advisor, *Revelle College, UC San Diego*

- 2010 – 2011 Student Conduct Code Re-write Workgroup Student Representative, *UC San Diego*
- 2010 – 2011 Housing, Dining, Hospitality Advisory Committee Student Representative, *UC San Diego*
- Summer 2010 Parent Orientation Leader, *Revelle College, UC San Diego*
- 2009 – 2010 Revelle College Senator, *Associated Students, UC San Diego*
- 2008 – 2009 Director of Communications, *Revelle College Council, UC San Diego*

## AWARDS & HONORS

---

- 2016 IEEE InfoVis Best Paper Award (Vega-Lite)
- 2016 – 2018 Google PhD Fellowship
- 2013 ACM CHI Best Paper Award (Webzeitgeist)
- 2011 – 2014 SAP Stanford Graduate Fellowship, *Stanford University*
- 2011 Outstanding Senior, *UC San Diego Alumni Association*
- 2011 Phi Beta Kappa, *UC San Diego*
- 2010 Undergraduate Summer Research Scholar, *Calit2, UC San Diego*
- 2009, 2010 Ernest Mort Award for Excellence in Leadership, *Revelle College, UC San Diego*
- 2009 Tau Beta Pi, *UC San Diego*
- 2008 – 2010 Provost's Honors, *Revelle College, UC San Diego*
- 2005 – 2007 Duke of Edinburgh Bronze, Silver and Gold Awards

## PRESS

---

- 2018 Google Researchers Are Learning How Machines Learn  
*Cade Metz, The New York Times, March 2018*  
<https://www.nytimes.com/2018/03/06/technology/google-artificial-intelligence.html>
- 2015 Information is Beautiful Award Shortlist Nomination  
*Kantar, November 2015*  
<http://www.informationisbeautifulawards.com/showcase?acategory=free-tool&action=index&award=2015&controller=showcase&page=1&pcategory=long-list&type=awards>
- 2014 Apropose Closes \$1.875M Funding Round Led by NEA and Andreessen Horowitz  
*PR Newswire, September 2014.*  
<http://www.prnewswire.com/news-releases/apropose-closes-1875m-funding-round-led-by-nea-and-andreessen-horowitz-274728751.html>
- 10 Significant Visualization Developments: January to June 2014.  
*Visualizing Data, August 2014.*  
<http://www.visualisingdata.com/index.php/2014/08/10-significant-visualisation-developments-january-to-june-2014/>
- 2008 Movable Type Experts Team Up on Melody, an Open Source Publishing Platform  
*Techcrunch, June 2009*  
<http://techcrunch.com/2009/06/25/movable-type-experts-team-up-on-melody-an-open-source-publishing-platform/>

- 2007 Why We Call it a “Community”  
*Six Apart/Movable Type, August 2007.*  
<http://www.movabletype.com/blog/2007/02/why-we-call-it-a-community.html>

## REFERENCES

---

**Jeffrey Heer**

Professor of Computer Science  
and Engineering  
*University of Washington*  
jheer@uw.edu

**James D. Hollan**

Distinguished Professor of  
Cognitive Science & Professor of  
Computer Science and Engineering  
*University of California, San Diego*  
hollan@ucsd.edu

**Martin Wattenberg**

Senior Staff Research Scientist  
*Google, Inc.*  
wattenberg@google.com

**Wendy E. Mackay**

Research Director  
*INRIA Saclay, France*  
mackay@lri.fr

**Maneesh Agrawala**

Professor of Computer Science  
*Stanford University*  
maneesh@cs.stanford.edu

**Scott R. Klemmer**

Professor of Cognitive Science &  
Computer Science and Engineering  
*University of California, San Diego*  
srk@ucsd.edu

**Michel Beaudouin-Lafon**

Professor of Computer Science  
*Université Paris-Sud, France*  
mbl@lri.fr