

HEIDI HOWARD

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RESEARCH INTERESTS

Distributed systems, consensus algorithms, consistency, reliability, cloud computing

EDUCATION

University of Cambridge, Pembroke College *October 2014 - present*

PhD in Computer Science, Advisor: Prof. Jon Crowcroft

Thesis title: Distributed consensus revised

University of Cambridge, Pembroke College *2010-2014*

BA Computer Science

Dissertation title: Analysis of Raft consensus

Southfield School for Girls, Northamptonshire *2003-2010*

A levels: Mathematics, Further Mathematics, Physics (A*) *2010*

Information Communication Technology, Biology (A)

AS Level: Geography (A) *2009*

EMPLOYMENT

VMware Research Group *July 2016 - Oct 2016*

Research Intern *Palo Alto, California*

- Developed and published Flexible Paxos, a revision to the foundation of Lamport's Paxos algorithm, for distributed consensus.

Raspberry Pi Summer Project, University of Cambridge *June 2014 - Oct 2014*

Intern *Cambridge, UK*

- Developing a educational platform for learning Python in the Raspberry Pi.

System Research Group, University of Cambridge *Sept 2012 - Oct 2013*

Research Assistant *Cambridge, UK*

- Working on the Public Access Wifi Service, customising OpenWRT firmware for community Wi-Fi sharing and bandwidth measurement
- Working on project Signpost, a distributed name service with secure tunnelling for devices on the edge network. Highlights include presenting the project alongside speakers such as Jon "maddog" Hall
- Joining OCaml Labs group and working towards building a sustainable platform for the language and contributing towards the Real World OCaml book

System Research Group, University of Cambridge *June 2012 - Aug 2012*

Undergraduate Research Opportunity Project *Cambridge, UK*

- Testing the accuracy of network measurements performed for project Signpost for ACM SIGCOMM 2012 demo and researching new network traversal tactics for project Signpost.

SELECTED PUBLICATIONS

Heidi Howard, Dahlia Malkhi, Alexander Spiegelman

Flexible Paxos: Quorum intersection revisited

In Proceedings of the 20th International Conference on Principles of Distributed Systems (OPODIS), December 2016

Hamed Haddadi, Heidi Howard, Amir Chaudhry, Jon Crowcroft, Anil Madhavapeddy, Derek McAuley, Richard Mortier

Personal Data: Thinking inside the box

In Proceedings of the 5th decennial Aarhus conference: Critical Alternatives, August 2015

Heidi Howard, Malte Schwarzkopf, Anil Madhavapeddy and Jon Crowcroft

Raft refloated: Do we have consensus?

ACM SIGOPS Operating Systems Review, January 2015

Heidi Howard

ARC: Analysis of Raft Consensus

University of Cambridge, Computer Laboratory, UCAM-CL-TR-857, August 2014

Charalampos Rotsos, Heidi Howard, David Sheets, Richard Mortier, Anil Madhavapeddy, Amir Chaudhry, Jon Crowcroft

Lost in the Edge: Finding Your Way with DNSSEC Signposts

In Proceedings of the 3rd USENIX Workshop on Free and Open Communications on the Internet (FOCI), August 2013

INVITED TALKS

Consensus: Why Can't We All Just Agree?

- QCON, London *March 2018*

Constructing scalable, resilient and consistent systems with Flexible Paxos

- DockerCon, Austin *April 2017*
- Systems Research Challenges Workshop, Newcastle *January 2017*

Flexible Paxos: Revisiting quorum intersection using TLA+

- Dr TLA+ series, Microsoft Research, Cambridge *November 2016*

Flexible Paxos: Quorum intersection revisited

- Systems Research Group Seminar, Cambridge *November 2016*
- Various venues including Facebook, Docker and VMware, California *August-Sept 2016*

Distributed consensus: Making impossible possible

- CodeMesh, London *November 2016*
- O'Reilly OSCON, London *October 2016*
- J on the Beach, Malaga *May 2016*
- QCON, London *March 2016*

Ios consensus: Why work when you can delegate?

- Systems Research Group Seminar, Cambridge *June 2016*
- VMware Research Group Seminar, Palo Alto *July 2016*

Reaching reliable agreement in an unreliable world

- Cambridge Tech Talks, Cambridge *November 2015*

Life on the Edge: New Abstractions for Edge Network Distributed Computing

- 2nd Oxbridge Women in Computer Science Conference, Oxford *March 2015*

SELECTED POSTERS & DEMOS

Coracle: Evaluating consensus at the internet edge

- ACM SIGCOMM, London *August 2015*

Unanimous: In Pursuit of Consensus at the Internet Edge

- Microsoft Research PhD Summer School, Cambridge *July 2015*
- EuroSys Student Workshop, Bordeaux *April 2015*

Providing Security for Wireless Community Networks

- ACM MobiCom Workshop on LCD Networking for Universal Access, Miami *September 2013*
- Workshop on Participatory Networks and Privacy, Nottingham *September 2013*

Ubiquitous Access to Public Services Online with PAWS

- Women@CL Mini Conference, Cambridge *April 2013*

Signposts: Taking back the dark edges of the internet

- Workshop on Open Hardware, Software, Internet & Jobs, Cambridge *March 2013*
- Digital Futures 2012: 3rd Annual Digital Economy All Hands Conference, Aberdeen *October 2012*
- Making the Most of Mobile Workshop, Cambridge *September 2012*

HONORS & AWARDS

General awards:

- ACM Student Research Competition Winner at SIGCOMM *August 2015*
- Best presentation award at 2nd Oxbridge Women in CS Conference *March 2015*
- 2nd Prize in the 2nd year poster competition at BCSWomen Lovelace Colloquium *April 2013*
- DevCSI Competition Winner at BCSWomen Lovelace Colloquium *April 2012*

Selected for participation (with travel award):

- European Women In Tech Conference, Amsterdam *November 2017*
- Mentoring moments at ACM SIGCOMM, London *August 2015*
- EuroSys Student Workshop, Bordeaux *April 2015*
- SIGPLAN Programming Languages Mentoring Workshop at POPL, Mumbai *January 2015*
- BCSWomen Lovelace Colloquium, Nottingham *April 2013*
- SIGPLAN Programming Languages Mentoring Workshop at POPL, Rome *January 2013*
- Google European Android Developments Camp, London *August 2012*
- IBM Best Student Recognition Event, Brussels, *July 2012*

- BCSWomen Lovelace Colloquium, Bath *April 2012*

Selected for participation:

- Cyber Security Summer School, Estonia *July 2015*
- Microsoft Research PhD Summer School, Cambridge *July 2015*

SERVICE

Program Committee Member:

- 3rd Annual UK Systems Research Challenges Workshop *2018*
- Tiny Transactions on Computer Science (Volume V) *2016*
- EuroSys Shadow Program Committee *2015*

External reviewer:

- ACM Symposium on Principles of Distributed Computing (PODC) *2017*

Student Volunteer:

- ACM SIGCOMM, London *August 2015*
- ACM SIGPLAN ICFP, Gothenburg *September 2014*
- ACM SIGPLAN ICFP, Boston *September 2013*

Committee Member:

- Group representative for Graduate Student Forum *2014 - 2017*
- Graduate representative for Staff Student Consultative Committee *2014 - 2015*
- Undergraduate representative for Women@CL *2011 - 2014*
- Treasurer/Communication officer for Stokes Science Society *2011 - 2014*
- College representative for Cambridge Student Community Action *2011 - 2012*
- Communications officer for Pembroke Players *2010 - 2011*

Teaching

- Guest facilitator for Advanced Topics in Computer Systems *Lent 2017 & 2018*
- Guest lecturer & Coordinator for the Research Student Lecture Series *Michaelmas 2015*
- Supervisor for Foundations of Computer Science *Michaelmas 2014, 2015 & 2016*
- Supervisor for Software Engineering *Michaelmas 2015*
- Ticker for SML Programming Practicals *Michaelmas 2014 & 2015*
- Supervisor & Demonstrator for Sutton Trust Summer School *Summer 2013 & 2014*
- Training in supervising final year projects, advanced supervising and lecturing *Various*

Miscellaneous:

- System Research Group Talklet Organiser *June 2014 - Nov 2015*
- Outreach videos on Computerphile:
 - Paxos Agreement (70,000 views) *April 2016*
 - Consensus & Organising Coffee (60,000 views) *Oct 2015*

REFERENCES

Prof. Jon Crowcroft
University of Cambridge
Jon.Crowcroft@cl.cam.ac.uk

Dr. Anil Madhavapeddy
University of Cambridge
Anil.Madhavapeddy@cl.cam.ac.uk