

# Heidy A. Khlaaf

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<http://heidykhlaaf.com>  
h.khlaaf@ucl.ac.uk (+44 7446596187)

- EDUCATION**
- University College London** **Sept 2013 - January 2018**  
*PhD:* Computer Science  
*Advisors:* Nir Piterman  
*Topic(s):* Formal Verification, Temporal Logic,  
and Model Checking of Infinite-State Systems
- Florida State University** **Dec 2012**  
*Bachelor of Science:* Computer Science, Philosophy  
Minor: Mathematics  
*Summa cum laude*, Phi Beta Kappa; **3.9 GPA**  
**Honors Thesis Title:**  
“Temporal Property Verification”
- CONSULTANCY & RESEARCH**
- Adelard LLP** **London, UK June 2017 - Present**  
*Consultant*
- Consultancy, research and training in safety and security related systems and their production; and production of standards and guidelines for safety and security related applications and their development.
  - Evaluating, designing, specifying, and verifying safety related systems and dependable computing applications using various techniques including: formal methods, model checking, static analysis as well as statistical analysis of field data and a variety of testing techniques.
  - Carrying out safety and security assessments that contribute to the assurance of clients’ projects by assisting with hazard analysis, providing independent advice, and reviewing their safety and security cases.
- Amazon Web Services** **New York, NY June 2015 - Sep 2015**  
*Security Research Scientist Intern*
- Analyzed the application of static analysis methods to resolve a wide variety of SSL certification validation bugs which are pervasive in Amazon’s EC2 Java client library, Elastic Load Balancing API Tools, and Amazon Flexible Payments SDK.
- Microsoft Research** **Cambridge, UK Oct 2013 - May 2014**  
*Contractor*
- Conducted further research and development to extend the functionality and applicability of the Temporal Logic Verifier **T2** to incorporate strictly more expressive logics such as Fair-CTL and CTL\*.
- Microsoft Research** **Cambridge, UK Jan 2013 - April 2013**  
*Programming Languages Research Intern*
- Discovered how procedure summarization, precondition synthesis, and traditional bottom up approaches complement each other to improve the performance and applicability of novel Computation Tree Logic verification tools.
- Microsoft Research** **Cambridge, UK May 2012 - Aug 2012**

*Programming Languages Research Intern*

- Encoded temporal property verification as program analysis task. Produced an encoding which, with the use of recursion and nondeterminism, enables off-the-shelf program analysis tools to naturally perform the reasoning necessary for proving temporal properties in T2.

**Florida State University**

**Tallahassee, FL Sep 2010-Aug 2012**

*Research Assistant*

- Assisted in the exploitation of parallelism found within functional programming in order to construct an intrinsically parallel language which exhibits intuitive parallel syntax.
- Created a statically-typed functional language that integrates seamlessly with C/C++. The language will have a functional declarative style, will be highly efficient to translate and execute, provides explicit and implicit parallel constructs, list comprehensions, and pattern matching.

**Tufts University**

**Medford, MA June 2010-Aug 2010**

*Computer Science Research Intern*

*Participant of the Computer Research Association - DREU for Undergraduates*

- Constructed a system that crawls the web in order to find participants who are involved in computer science or engineering academia.
- Utilized machine learning algorithms for automatic text-based classification in attempt to identify females among an uneven gender distribution of computer scientists.

**PUBLICATIONS Refereed Publications**

“The Past, Present, and Future(s): Verifying Temporal Software Properties”

**H. Khlaaf.** *University College London, Department of Computer Science*, PhD Dissertation, April 2018, London, UK.

“Verifying Increasingly Expressive Temporal Logics for Infinite-State Systems”

**H. Khlaaf** with B. Cook and N. Piterman. *Journal of ACM*, 64, 2, Article 15 (May 2017), 39 pages.

“T2: Temporal Property Verification”

**M. Brockschmidt and H. Khlaaf** with B. Cook and N. Piterman. *Tools and Algorithms for the Construction and Analysis of Systems*, Eindhoven, Netherlands, 2016.

“On Automation of CTL\* Verification for Infinite-State Systems”

**H. Khlaaf** with B. Cook and N. Piterman. *Computer Aided Verification*, San Francisco, USA, 2015.

“Fairness for Infinite-State Systems”

**H. Khlaaf** with B. Cook and N. Piterman. *Tools and Algorithms for the Construction and Analysis of Systems*, London, UK, 2015.

“Faster Temporal Reasoning for Infinite-State Programs”

**H. Khlaaf** with B. Cook and N. Piterman. *Formal Methods in Computer-Aided Design*, Lausanne, Switzerland, 2014.

**Refereed Workshops**

“Abstract: Fairness for Infinite-State Systems”

**H. Khlaaf** with B. Cook and N. Piterman. *14th International Workshop on Termination*, Vienna, Austria, 2014.

### Media

“Cultural Ramifications of Technical Interviews.”

**H. Khlaaf**. *Model View Culture*, Issue 23, June 2015.

## TEACHING

**University College London**                      **London, UK September 2016-Present**

*Teaching Assistant*

- *COMP204P: Systems Engineering I*    Fall 2016
- *COMP205P: Systems Engineering II*    Spring 2017

**Florida State University**                      **Tallahassee, FL August 2011-Dec 2012**

*Teaching Assistant (20 hours/week)*

- *Instructed recitation sessions, assessed assignments, projects, exams, and held daily office hours to assist students.*

*COP4342 Unix Tools*    Fall 2012

*COP3330 Object Oriented Programming*    Spring 2012

*COP3330 Object Oriented Programming*    Fall 2011

*COP3353 Introduction to Unix*    Fall 2011

## TALKS

### Technical

- *Trust in AI Development @ Open AI/PAI*                      *April 2019 San Francisco, CA*  
Invited Speaker: “Assurance Frameworks for Autonomous Safety Critical Systems”
- *Papers We Love @ StrangeLoop*    *Sep 2018 St. Louis, Missouri*  
Invited Speaker: “Standards We Love”
- *F# eXchange*    *April 2018 London, UK*  
Invited Speaker: “Lessons from F#: From Academic Prototypes to Safety-Critical Systems”
- *Github Constellation*    *March 2018 London, UK*  
Invited Speaker: “Determining Software Safety in Critical Systems”
- *Tech Night LDN*    *March 2018 London, UK*  
Invited Panel Speaker: “Diversity in Technology”
- *University of East London*    *Nov 2017 London, UK*  
Invited Speaker: “Verification of Software Systems, Smart Sensors and the Nuclear Industry”
- *Queen Mary University*    *March 2017 London, UK*  
Invited Speaker: “Verifying Increasingly Expressive Temporal Logics for Infinite-State Systems”
- *University of Kent*    *Dec 2016 Canterbury, UK*  
Invited Speaker: “Verifying Increasingly Expressive Temporal Logics for Infinite-State Systems”
- *TACAS*    *April 2016 Eindhoven, Netherlands*  
Speaker: “T2: Temporal Property Verification”
- *Computer Aided Verification*    *July 2015 San Francisco, USA*  
Speaker: “On Automation of CTL\* Verification for Infinite-State Systems”

- *TACAS* April 2015 London, UK  
Speaker: "Fairness for Infinite-State Systems"
- *University of Leicester* March 2015 Leicester, UK  
Invited Speaker: "Verifying Fairness for Infinite-State Systems"
- *Formal Methods in Computer-Aided Design* Oct 2014 Lausanne, Switzerland  
Speaker: "Faster Temporal Reasoning for Infinite-State Systems"
- *14th International Workshop on Termination* July 2014 Vienna, Austria  
Speaker: "Fairness for Infinite-State Systems"
- *F#unctional Londoners* March 2013 London, UK  
Invited Speaker: "T2: A Temporal Property Verifier in F#"

### Non-Technical

- *Microsoft Research* Dec 2012 Cambridge, UK  
Keynote Speaker at Think Computer Science 2012
- *Long Road Sixth Form College* July 2012 Cambridge, UK  
Invited Guest Speaker

## COMMUNITY

### Program Committee

<i>DebugML, ICLR</i>	March 2019
<i>Principles of Programming Languages AE</i>	October 2016
<i>Computer-Aided Verification AE</i>	May 2016
<i>Tiny Transactions on Computer Science (V. IV)</i>	Jan 2016
<i>Tiny Transactions on Computer Science (V. II)</i>	March 2013

### Sub-Review Committee

<i>Tools and Algorithms for the Construction and Analysis of Systems</i>	Nov 2015
<i>International Conference on Computer-Aided Verification</i>	March 2015
<i>International Conference on Computer-Aided Verification</i>	February 2014
<i>International Conference on Computer-Aided Verification</i>	February 2013
<i>Formal Methods in Computer-Aided Design</i>	July 2012

### Program Chair

<i>Tiny Transactions on Computer Science (V. III)</i>	May 2014 - May 2015
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### Activities & Services

<i>UCL - Athena Swan PhD Student Representative</i>	2016-2017
<i>UCL - PPLV PhD Student Representative</i>	2015-2017
<i>UCL - PhD Student Representative</i>	2013-2015
<i>Upsilon Pi Epsilon - Florida State University Chapter President</i>	2012
<i>ACM - Florida State University Chapter Undergraduate Vice President</i>	2012
<i>ACM - Florida State University Chapter Historian</i>	2011
<i>ACM - Florida Sate University Chapter Graphic Designer</i>	2010

### Professional Memberships

Association for Computing Machinery  
ACM SIGPLAN  
Phi Beta Kappa

## AWARDS AND HONORS

<i>International Conference on CAV - Best Paper Award</i>	July 2015
<i>University College London - Research Excellence Studentship</i>	Sept 2013
<i>National Science Foundation - Graduate Research Fellowship</i>	Sept 2013

<i>Summer School of Marktoberdorf - Attendee</i>	<i>Aug 2013</i>
<i>CRA-W/CDC/SIGPLAN Mentoring Workshop at POPL Scholarship</i>	<i>Jan 2013</i>
<i>Departmental Travel Grant - Grace Hopper Celebration</i>	<i>Oct 2012</i>
<i>CRA-W/CDC/SIGPLAN Mentoring Workshop at POPL Scholarship</i>	<i>Jan 2012</i>
<i>Fall 2011 Bess Ward Honors Thesis Award</i>	<i>Fall 2011</i>
<i>Departmental Travel Grant - Grace Hopper Celebration</i>	<i>Nov 2011</i>
<i>Florida State University President's List</i>	<i>2010 - 2012</i>
<i>Florida Medallion Scholar</i>	<i>2008 - 2012</i>
<i>Florida State University Dean's List</i>	<i>2008 - 2012</i>
<i>R M Beall Sr Charitable Foundation recipient</i>	<i>2008 - 2012</i>
<i>National SMART Grant recipient</i>	<i>2008 - 2011</i>

## **SKILLS**

*Languages & Software:* C++, C, F#, Perl, LLVM IR, Haskell, Prolog, Scheme, C#, Java, PHP, ASP, Javascript, Bash Script.  
*Operating Systems:* Adept in Windows, Unix, Linux, and Mac OS.  
*Other:* Fluency in the Arabic Language