

# Lilian de Greef

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## SUMMARY

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I am a PhD student at the University of Washington with an **NSF fellowship** and **Microsoft Research PhD fellowship**, advised by Shwetak Patel in the **Ubiquitous Computing Lab**. Within the broad spectrum of ubiquitous computing, my interests include **computer vision**, **embedded systems**, **machine learning**, and **HCI**. My current research focuses on lowering the access barrier to medical care, using low cost commodity hardware with trained image analysis and innovative user interface design.

## EDUCATION

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**University of Washington** 9/2012 – present  
Ph.D. Student, Computer Science  
Area: Ubiquitous Computing  
Advisor: Dr. Shwetak Patel

**Harvey Mudd College** 8/2008 – 5/2012  
Bachelor of Science, Computer Science  
Graduated with distinction  
GPA: 3.6/4.0

## HONORS AND AWARDS

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- National Science Foundation Graduate Research Fellowship: 2013 – present
- Microsoft Research PhD Fellowship: 2015 – 2017
- Microsoft Research Graduate Women's Scholar: 2013 – 2014
- Marilyn Fries Endowed Regental Fellowship: 2012 – 2013
- President Scholar's Program (4 year full-tuition merit scholarship): 2008 – 2012
- University of Washington CSE Three-Sixty Fellowship Fund: 2012
- People's Choice Prize at UW CSE's Industry Affiliates Meeting: 2014
- Graduated Harvey Mudd College with honors in computer science: 2012
- Graduated Harvey Mudd College with honors in humanities, social sciences, and the arts: 2012
- Dean's List: Spring 2009, Fall 2009, Fall 2010, Fall 2011, Spring 2012

## PUBLICATIONS

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Taylor, J.A., Stout, J.W., **de Greef, L.**, Goel, M., Patel, S., Chung, E.K., Koduri, A., McMahon, S., Dickerson, J., Simpson, E.A. and Larson, E.C., 2017. *Use of a Smartphone App to Assess Neonatal Jaundice*. Pediatrics, p.e20170312.



**de Greef, L.**, Goel, M., Seo, M.J., Larson, E.C., Patel, S.N., Stout, J.W., Taylor, J.A. *BiliCam: Using Mobile Phones to Monitor Newborn Jaundice*. ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp) 2014 **Best paper nominee**

Boulanger, C., Boulanger, A., **de Greef, L.**, Kearney, A., Sobel, K., Transue, R., Sweedyk, Z., Dietz, P., Bathiche, S. *Stroke Rehabilitation with a Sensing Surface*. 2013 ACM SIGCHI Conference on Human Factors in Computing Systems Proceedings (CHI) 2013

Berezny, N., **de Greef, L.**, Jensen, B., Sheely, K., Sok, M., Lingenbrink, D., Dodds, Z. *Accessible Aerial Autonomy*. IEEE International Conference on Technologies for Practical Robot Applications (TePRA) 2012

## PROJECT EXPERIENCE

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### **Graduate Research, University of Washington**

9/2012 – present

*Advisor: Shwetak Patel*

Currently investigating how to use smartphone cameras to screen newborns for dangerous levels of jaundice, or yellowing of the skin, in close collaboration with UW Medical Center. Developed data collection procedures and software, applying computer vision to parse images, and using machine learning to estimate jaundice levels. Thus far in two publications, two patents, commercial development.

### **Research Intern, Microsoft Research Redmond**

6/2015 – 9/2015

*Manager: Merrie Morris*

Conceived and developed a prototype of TeleTourist, a system that uses video calls with strangers to share experiences for people with mobility restrictions. Interviewed individuals with mobility restrictions as formative work, designed system features, and implemented a subset of them for a prototype. Presented the work as a poster at CSCW 2016 and resulted in a patent.

### **Research Science Intern, Amazon**

6/2014 – 9/2014

*Manager: Jim Curlander*

Designed, developed, and evaluated eyes and head tracking based user interface elements for enhanced reality interfaces in fulfillment centers. Combined concepts from computer graphics with HCI Produced several prototypes, demonstrated the system in its intended environment. Resulted in a patent.

### **Microsoft Computer Science Clinic, Harvey Mudd College**

9/2011 – 5/2012

*Faculty Advisor: Z Sweedyk*

*Microsoft Liaison: Cati Boulanger*

Designed and developed technology to motivate and assess rehabilitation for stroke patients affected in their upper extremities, using the Microsoft Surface in team of four. Interviewed stroke patients and physical therapists, designed a rehabilitative game played on the Microsoft Surface, produced a prototype, and ran user study with stroke patients.

### **Undergraduate Research, Harvey Mudd College**

6/2011 – 8/2011

*Advisor: Zachary Dodds*

Created and explored vision-based localization algorithms for aerial robots, in team of five students. Prototyped autonomous cooperation between ground-based and airborne robots. Demonstrated localization for a quadrotor helicopter toy using only a built-in camera.

## PATENTS

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Colburn, R.A., Curlander, J.C., Gorumkonda, G.K., de Greef, L., inventors; Aug. 2017. **Perspective-Aware Projected User Interfaces**. United States patent US 9723248 B1.

Quinn, K.I., Morris, M., Venolia, G., Tang, J., de Greef, L., inventors; Mar. 2017. **Immersive Telepresence**. United States patent US 9591260 B1.

Taylor, J.A., Patel, S.N., Stout, J.W., de Greef, L., Goel, M., Larson, E.C., inventors; Dec. 2015. **Systems, Devices, and Methods for Estimating Bilirubin Levels**. United States patent US 20150359459 A1.

Taylor, J.A., Patel, S.N., Stout, J.W., de Greef, L., Goel, M., Larson, E.C., inventors; Oct. 2014. **Estimating Bilirubin Levels**. United States patent US WO2014172033 A1.

## SKILLS

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Programming: Python, C++, OpenCV, Java, Arduino, SystemVerilog, Objective-C, C#, Scheme, Prolog

Software: SolidWorks, Autodesk Inventor, Photoshop, Autodesk 3DS Max

Hardware: 3D printing, laser cutting, eTextiles fabrication, machining for metal and wood

## TEACHING & MENTORING

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**Predocctoral Instructor, Data Structures and Algorithms for Non-Majors** Summer 2017

*Paul Allen School of Computer Science and Engineering, University of Washington*

Prepared and delivered lectures with interactive activities for a class of 67 students ranging from high school to graduate school students with a diverse set of majors. Managed a team of 5 teaching assistants; prepared homework assignments; wrote, proctored, and graded exams; hosted office hours; and mentored some students one-on-one outside of office hours. Rated 4.4/5 in course review.

**Teaching Assistant, Data Structures and Algorithms for Non-Majors** Summer 2016

*Paul Allen School of Computer Science and Engineering, University of Washington*

Prepared and ran review sections, hosted and tutored students in office hours, graded homework assignments, and helped proctor and grade exams for a class of 78 students. Worked in a team with two other teaching assistants.

**Graduate Mentor, Undergraduate Research in the Ubicomp Lab** 2014 - 2015

*Paul Allen School of Computer Science and Engineering, University of Washington*

Mentored two undergraduate students to participate in research projects. Helped them learn and develop skills for applying computer vision. Also helped one practice skills for developing in iOS.

**Grader and Tutor, Multiple Courses** 2010 - 2012

*Computer Science Department, Harvey Mudd College*

Tutored students in office hours and graded homework for multiple semesters. Tutored and graded for Principles of Computer Science in fall 2010, Data Structures and Program Development the other terms.

## TALKS

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**BiliCam: Using Mobile Phones to Monitor Newborn Jaundice.** ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp), Seattle, WA, 16 September 2014

**Using Mobile Technology to Monitor Bilirubin and Diagnose Jaundice in Infants.** Global WACH Seminar Series, Seattle, WA, 12 February 2014 (**Invited Speaker**)

**Ubiquitous Computing: Our Approach to Technology Innovations.** Northwest Regional Women in Computing (NWRWIC), Portland, OR, 19 October 2013 (**Distinguished Speaker**)

**Stroke Rehabilitation with the Microsoft Surface.** Harvey Mudd College Projects Day, Claremont, CA, 1 May 2012.

**Microsoft Surface for Stroke Rehabilitation.** Celebration of Women in Computing in Southern California (CWIC-SoCal), Santa Ana, CA, 14 April 2012.

**Accessible Aerial Autonomy.** Celebration of Women in Computing in Southern California (CWIC-SoCal), Santa Ana, CA, 14 April 2012.

**Accessible Aerial Autonomy.** Harvey Mudd College Computer Science Colloquium, Claremont, CA, 8 September 2011

**LogiSketch: An Intuitive System for Sketching and Simulating Logic Circuits.** Harvey Mudd College Computer Science Colloquium, Claremont, CA, 21 October 2010

## DEMONSTRATIONS

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Berezny, N., **de Greef, L.**, Jensen, B., Sheely, K., Sok, M., Dodds, Z. *Accessible Aerial Autonomy via ROS.* Association for the Advancement of Artificial Intelligence (AAAI), San Francisco, CA, June 2011

Berezny, N., **de Greef, L.**, Jensen, B., Sheely, K., Sok, M., Dodds, Z. *Autonomous Robot Cooperation.* Global Conference on Educational Robotics (GCER), Orange County, CA, July 2011

## **SERVICE**

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<b>K-12 Outreach</b> , University of Washington Open House, Tours, Demos	2012 – present
<b>Student Volunteer</b> , UbiComp Conference	2013, 2014, 2015
<b>Graduate Student Co-Coordinator</b> , University of Washington CSE	2013 – 2015
<b>Alumni Interviewer</b> , Harvey Mudd College Admissions Office	2012 – 2014
<b>Role Model &amp; Mentor</b> , she++	2012 – 2013
<b>Mentor</b> , WitsOn (Women in Technology Sharing Online)	2012 – 2013