

# FRANCESKA XHAKAJ

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## EDUCATION

- 2015 - present                      **Ph.D. in Human-Computer Interaction**  
Human-Computer Interaction Institute  
School of Computer Science  
**Carnegie Mellon University**, Pittsburgh, PA  
Advisor: **Dr. Vincent Alevan**
- 2015 - 2017                         **M.S. in Human-Computer Interaction**  
Human-Computer Interaction Institute  
School of Computer Science  
**Carnegie Mellon University**, Pittsburgh, PA
- 2015 - present                      **PIER Associate**  
Program for Interdisciplinary Education Research at Carnegie Mellon  
University funded by the Institute of Education Sciences (IES)
- 2011 - 2015  
GPA: 3.92/4.00                      **B.S. in Computer Science**  
Minor in Mathematics  
Summa Cum Laude, Honors in Computer Science  
**Lafayette College**, Easton, PA
- Honors Thesis: "Intelligent tutors and granularity: A new approach to Red  
Black Trees."  
Advisor: Dr. Chun Wai Liew

## RESEARCH EXPERIENCE

- 2018 - present                      **Research Assistant**  
Human-Computer Interaction Institute  
**Carnegie Mellon University**, Pittsburgh, PA  
with Dr. Vincent Alevan
- Focus on helping students acquire conceptual and procedural knowledge of  
programming through an Intelligent Tutoring System that supports two types of  
conceptually-oriented activities: code tracing and code comprehension.  
Evaluate whether the tutor can support students' conceptual learning and  
transfer to procedural learning of computer programming.
- 2015 - 2018                         **Research Assistant**  
Human-Computer Interaction Institute  
**Carnegie Mellon University**, Pittsburgh, PA  
with Dr. Vincent Alevan and Dr. Bruce M. McLaren
- Followed user-centered design and used Contextual Inquiry, Interpretation  
Sessions, Affinity Diagramming, Storyboarding, Speed Dating and  
Prototyping to design a dashboard for middle-school mathematics teachers

who use ITSs. Ran studies in real classroom environments to evaluate the dashboard's effect on student learning for the domain of linear equation solving. Mentored 5 undergraduate students who were helping with developing and implementing the dashboard.

Summer 2015

**Student Researcher**  
Human-Computer Interaction Institute  
**Carnegie Mellon University**, Pittsburgh, PA  
with Dr. Vincent Alevan

Worked on classifying student errors in math in the Lynette Cognitive Tutor through log replaying of student data collected by the tutor. Designed and implemented bug rules in Jess and tested them, through a log replayer, with previously collected data.

Summer, Fall 2014

**Undergraduate Student Researcher**  
LearnLab  
**Carnegie Mellon University**, Pittsburgh, PA  
with Dr. Vincent Alevan

Redesigned and implemented an example-tracing engine in JavaScript, based on an implementation in Java. Collaborated with other researchers to test and enhance the functionality of the new engine.

Spring 2014

**EXCEL Student Researcher**  
**Lafayette College**, Easton, PA  
with Dr. Chun Wai Liew

Worked on adapting a tablet application (for geology field projects) as a tutor that uses question asking to teach students how to gather field data. Designed a question-asking framework to be used in a real classroom.

Summer 2013

**Undergraduate Student Researcher**  
PROLANGS@VT research group  
**Virginia Tech**, Blacksburg, VA  
with Dr. Barbara G. Ryder

Studied the dynamic behavior of JavaScript objects using data collected from popular web sites and modified a tracing infrastructure developed in C++. Designed experiments and collected data on the dynamic behavior of JavaScript objects.

January 2013

**EXCEL Student Researcher**  
**Lafayette College**, Easton, PA  
with Dr. Chun Wai Liew

Collaborated with a biology student and studied fish evolution. Analyzed fish models in Python, as well as designed and ran experiments to analyze how the speed of fish is affected by changes in their body parameters.

Summer 2012

**EXCEL Student Researcher**  
**Lafayette College**, Easton, PA  
with Dr. Chun Wai Liew

Worked on inferring information using Hidden Markov Models and the Viterbi Algorithm on the Iterated Diner's Dilemma game. Worked with an implementation of the game in Java and created scripts to run experiments and analyzed the collected data in R.

## CONFERENCE PUBLICATIONS

**Xhakaj, F.**, Aleven, V. (accepted, to appear 2018). Towards Improving Introductory Computer Programming with an ITS for Conceptual Learning. *AIED 2018, Young Researcher's Track (YRT)*

Bodily, R., Kay, J., Aleven, V., Davis, D., Jivet, I., **Xhakaj, F** & Verbert, K. Open learner models and learning analytics dashboards: A systematic review. In *Proceedings of the 8th International Conference on Learning Analytics and Knowledge (LAK)*, pp. 41-50. ACM, 2018.

**Xhakaj, F.**, Aleven, V., McLaren, B.M. (2017). Effects of a Teacher Dashboard for an Intelligent Tutoring System on Teacher Knowledge, Lesson Planning, Lessons and Student Learning. In É. Lavoué, H. Drachsler, K. Verbert, J. Broisin, M. Pérez-Sanagustín (Eds.), *Proceedings of the 12th European Conference on Technology Enhanced Learning, EC-TEL 2017*, (pp. 315-329). Springer International Publishing Switzerland.

**Xhakaj, F.**, Aleven, V., McLaren, B.M. (2017). Effects of a dashboard for an intelligent tutoring system on teacher knowledge, lesson plans and class sessions. In E. Andre, R. Baker, X. Hu, Ma. M. T. Rodrigo, B. du Boulay (Eds.), *Proceedings of the 18th International Conference on Artificial Intelligence in Education, AIED 2017*, (pp. 582-585). Springer International.

**Xhakaj, F.**, Aleven, V., McLaren, B.M. (2016). How teachers use data to help students learn: Contextual Inquiry for the design of a dashboard. In K. Verbert, M. Sharples, T. Klobočar (Eds.), *Proceedings of the 11th European Conference on Technology Enhanced Learning, EC-TEL 2016*, (pp. 340-354). Springer International Publishing Switzerland.

Aleven, V., **Xhakaj, F.**, Holstein, K., & McLaren, B. M. (2016). Developing a teacher dashboard for use with intelligent tutoring systems. In *Proceedings of the 4th International Workshop on Teaching Analytics at the 11th European Conference On Technology Enhanced Learning, IWTA 2016*.

Holstein, K., **Xhakaj, F.**, Aleven, V., & McLaren, B. M. (2016). Luna: A dashboard for teachers using intelligent tutoring systems. In *Proceedings of the 4th International Workshop on Teaching Analytics at the 11th European Conference On Technology Enhanced Learning, IWTA 2016*.

Aleven, V., Sewall, J., Popescu, O., **Xhakaj, F.**, Chand, D., Baker, R. S., & Gasevic, D. (2015). The beginning of a beautiful friendship? Intelligent tutoring systems and MOOCs. In C. Conati, N. Heffernan, A. Mitrovic, & M. F. Verdejo (Eds.), *Proceedings of the 17th International Conference on AI in Education, AIED 2015* (pp. 525–528). New York: Springer.

Liew, C. W., & **Xhakaj, F.** (2015). Teaching a complex process: Insertion in Red Black Trees. In C. Conati, N. Heffernan, A. Mitrovic, & M. F. Verdejo (Eds.), *Proceedings of the 17th International Conference on Artificial Intelligence in Education, AIED 2015* (pp. 698–701). New York: Springer International Publishing.

**Xhakaj, F.**, & Liew, C. W. (2015). A new approach to teaching Red Black Trees. In V. Dagienė, C. Schulte, & T. Jevsikova (Eds.), *Proceedings of the 20th ACM Annual Conference on Innovation and Technology in Computer Science Education, ITiCSE '15* (pp. 278–283). New York: ACM.

## JOURNAL PUBLICATIONS

Wei, Sh., **Xhakaj, F.**, & Ryder, B.G. (2015) Empirical Study of the Dynamic Behavior of JavaScript Objects. *Journal of Software: Practice and Experience*, 46, 7, 867–889.

## UNPUBLISHED SENIOR THESIS

**Xhakaj, F.** (2015). Intelligent tutors and granularity: A new approach to Red Black Trees. Unpublished senior thesis, Department of Computer Science, Lafayette College, Easton, Pennsylvania. USA.

## TEACHING AND MENTORING EXPERIENCE

- Spring 2018                      **Teaching Assistant, Programming Usable Interfaces (PUI)**  
*Human-Computer Interaction institute at Carnegie Mellon University*  
Lead and oversaw lab sessions, designed some labs and homework assignments, designed some quiz and exam questions, graded student work, provided feedback on assignments, projects and assessments
- Spring 2018                      **Guest Lecture, Programming Usable Interfaces (PUI)**  
*Human-Computer Interaction institute at Carnegie Mellon University*  
Held a guest lecture related to introduce students to some user-centered design methods and examples of their use in my own research
- Summers 2015 - 2017           **LearnLab Summer School Mentor, ITS Track**  
*LearnLab, ITS Track at Carnegie Mellon University*  
Mentored groups of students each summer during hands-on activities. Assisted with brainstorming domains and tasks, designing interfaces and building Intelligent Tutoring Systems (ITS) with these tasks and interfaces using the Cognitive Tutor Authoring Tools (CTAT)
- Summer 2016                    **REU Mentor**  
*Human-Computer Interaction institute at Carnegie Mellon University*  
Mentored 5 REU students who were involved with research, interface design and software development on the teacher dashboard project
- 2013 - 2014                    **Teaching Assistant, Algorithms and Data Structures**  
*Computer Science Department at Lafayette College*  
Led and oversaw lab sessions, built some assignments and labs

## AWARDS AND HONORS

- 2015                              **Summa Cum Laude, Honors in Computer Science, Lafayette College**
- 2014                              **Upsilon Pi Epsilon Scholarship Award**  
Upsilon Pi Epsilon International Honor Society for the Computing and Information Disciplines
- 2014                              **James P. Schwarz Prize, Lafayette College**
- Every semester                **Dean's List, Lafayette College**
- 2011 - 2015                    **Walter Oechsle Scholarship, Lafayette College**
- 2012, 2013                    **Grace Hopper Celebration of Women in Computing Scholarship**

## **LEADERSHIP AND SERVICE**

Student Organizer	<b>Women in SCS@CMU organizing committee, 2017 – present</b> <b>OurCS conference organizing committee, 2017</b> <b>SCS4All Initiative organizing committee, 2017 – present</b> <b>HCI Ph.D. Tea Time – Social, 2018 – present</b> <b>HCI Ph.D. monthly lunches, 2016 – 2017</b> <b>HCII Prospective Ph.D. Student Open House, 2015</b> <b>HCI Korean - Japanese gatherings, 2015 – present</b>
Founder, President	<b>Women in Computing Club, Lafayette College, 2012 – 2015</b>
President	<b>Upsilon Pi Epsilon Club, Lafayette College, 2014 – 2015</b>
Peer Adviser	<b>International Student Association, Lafayette College, 2012 – 2013</b>

## **SKILLS**

Programming Languages	Java, JavaScript, Jess, C++, HTML, CSS, R, Python, C, Intel IA32
Tools	CTAT, Django, Ajax, jQuery, Heroku, NodeJs, SQLite, LaTeX, Mathematica, WordPress, Sketch, InVision, Adobe: Photoshop, Flash Player, InDesign
Research Methods	Contextual Inquiry, Interpretation Sessions, Affinity Diagramming, Speed Dating, Storyboarding, Prototyping, Directed Storytelling, Classroom Studies
Languages	English, Albanian, Italian, French, Greek, Korean