lisaelkin

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Ph.D. student, Computer Science & Engineering (HCI)

research statement

I am a researcher in human-computer interaction (HCI). In general, I am interested in enabling people to interact with computing in new and exciting ways. Specifically, I design, develop, and evaluate novel hardware devices that enable new input and interaction techniques. I evaluate these techniques rigorously using statistical methods, which I have also invented and created tools for.

education

2018 - present (GPA: 4.0/4.0)

Ph.D. Computer Science & Engineering - *University of Washington*

Human Computer Interaction

Advisors: Jacob O. Wobbrock, Shwetak N. Patel

2015 - 2018 (GPA: 95/100)

MMath Computer Science - *University of Waterloo*

Human Computer Interaction

Thesis: Contact-sensing Input Device Manipulation and Expertise

Advisor: Daniel Vogel

Note: Extra time in degree due to voluntarily taking all core CS undergrad courses

2013 - 2015 (GPA: 3.9/4.0)

Master of Entertainment Technology - *Carnegie Mellon University*

Interactive experiences and installations as a programmer and project manager

2008 - 2012 (GPA: 93/100)

BMath Combinatorics & Optimization Joint Pure Math, French Certificate - *University of Waterloo*

With Distinction - Dean's Honours List

skills

programming and hardware

Python, Java, Processing, Swift, C, C++, R, JavaScript, Vega-Lite, Altair, D3, C#, Racket, Unity

Arduino, Sensors, Electronic Prototyping

design and project management

3D modelling (3ds Max), 3D printing complex structures, Scrum, Photoshop

publications

Note about conference papers: In Human-Computer Interaction, conference proceedings are the preferred publication venue since they are timelier and typically have the greatest impact. Top-tier conferences are very selective with rigorous multi-stage reviews of full manuscripts creating high quality fully archival proceedings.

Note about venues: CHI (the ACM Conference on Human Factors in Computing Systems) and UIST (the ACM symposium on User Interface Software and Technology) are both recognized as very top tier HCI conferences (Google Scholar and Microsoft Academic both rank them as #1 and #3). The average acceptance rate for CHI is 23% and UIST 21%.

peer-reviewed conference proceedings

[C2] **Lisa A. Elkin**, Matthew Kay, James J. Higgins, Jacob O. Wobbrock. *Aligned Rank Transform for Multifactor Contrasts.* In The 34th Annual ACM Symposium on User Interface Software and Technology (UIST '21).

[C1] **Lisa A. Elkin**, Jean-Baptiste Beau, Géry Casiez, and Daniel Vogel. *Manipulation, Learning, and Recall with Tangible Pen-Like Input*. In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI '20).

peer-reviewed conference demos

[D1] **Lisa A. Elkin**, Jean-Baptiste Beau, Géry Casiez, and Daniel Vogel. 2020. *A 26-Contact Tangible Pen-Like Input Device for Capacitive Displays*. In Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems (CHI EA '20).

statistics tools

[T2] Matthew Kay, **Lisa A. Elkin**, James J. Higgins, Jacob O. Wobbrock. *ARTool: Aligned Rank Transform for Nonparametric Factorial ANOVA*. R Package. https://cran.r-project.org/package=ARTool. (2021)

[T1] Jacob O. Wobbrock, **Lisa A. Elkin**, James J. Hinoggins, Leah Findlater, Darren Gergle, Matthew Kay. *ARTool: Aligned Rank Transform for Nonparametric Factorial ANOVA*. Windows Application. http://depts.washington.edu/acelab/proj/art. (2021)

publicly available research code & data

Data and Analysis for [C2] *Aligned Rank Transform for Multifactor Contrasts.* https://github.com/lelkin/ART_Contrasts_Analysis. (2021)

interactive experiences (entertainment technology work)

(* indicates equal contributors)

[E3] **Lisa Elkin***, Hyunghwan Byun*, Yu-Cheng (Larry) Chang*, Rose Heid*, Maoyang Li*, Qing Mao*, Adarsh Telekadan Puthiyaveettil*, Scott Stevens, Jessica Trybus.
Energy Lab 2 (Vis Viva): Seismic Mapping and Geology Education Installation. Elizabeth Forward School District. (2015)

- Created interactive installation to teach middle school students about seismic mapping and rock properties.
- Focused on UI and gameplay programming using C# in Unity.
- Role: Programmer

[E2] **Lisa Elkin***, Jimit Bhalani*, Casey Ging*, Adarsh Pavani*, Juan Ramirez*, Shirley Saldamarco, Scott Stevens.
Energy Lab 1 (Infinite): Large Touch-screen Dome for Science Installation. Elizabeth Forward School District. (2014)

- Created 4ft wide, 2ft tall, diffuse illumination, hemispherical touch-screen.
- Created game for dome to teach middle school students about solar energy.
- Featured on CMU homepage (December 2015).
- Role: Project Manager

[E1] **Lisa Elkin***, Alex Hu*, Yan Jin*, Xuyan Ke*, Jack Koo*, Janet Lin*, Tim Rosko*, Brenda Harger, Ralph Vituccio.
Feed: A Massive Outdoor Game to Combat World Hunger. Games for Change Festival. (2014)

- Created mobile, geo-cached outdoor game motivated by experiences of food distribution volunteers.
- Interest from media outlets and organizations including World Food Program USA.
- Role: Project manager

theses and dissertations

[TH1] **Lisa Elkin**. *Contact-sensing Input Device Manipulation and Recall*. http://hdl.handle.net/10012/13205 (2018)

technical reports

[T1] **Lisa Elkin**, Ting Kei Pong, Stephen Vavasis. *Convex Relaxation for Finding Planted Influential Nodes in a Social Network.* https://arxiv.org/abs/1307.4047. (2013)

professional experience

June 2021 - September 2021

Apple Inc., Sensing Technologies Group, AI and Machine Learning - *Research Intern*
Manager: Gierad Laput

September 2018 - Present
University of Washington, ACE Lab - *Research Assistant*
Advisor: Jacob O. Wobbrock
- Augmenting commercially available smartphone accessory to enable 3D back-of-device interaction.
- Created, validated, and developed tools for a new pre-processing procedure for quantitative data analysis.

May 2018 - July 2018
Microsoft Research, EPIC Research Group - *Research Intern*
Manager: Ken Hinckley

June 2016 - April 2018
University of Waterloo, School of Computer Science - *Research Assistant*
Advisor: Daniel Vogel
- Designed, created, and evaluated new tangible pen-like input device.

June 2015 - August 2015
Carnegie Mellon University, School of Computer Science - *Programmer and Lead Designer*
- Created web-based, interactive, computer science education tools.

June 2012 - August 2012
University of Waterloo, Faculty of Mathematics - *Undergraduate Research Assistant*
- Research on influence maximization in social networks.

teaching experience

2021
University of Washington, Allen School of Computer Science & Engineering - *Graduate Teaching Assistant*
Teaching Assistant, CSE512: Data Visualization (Spring 2021)
- Graded assignments and held office hours focusing on Vega-Lite, Altair, and D3.

2015 - 2018
University of Waterloo, School of Computer Science - *Graduate Teaching Assistant*
Lab Instructor, CS106: Intro to Computer Programming 2 (Winter 2016, 2018)
- Ran lab with up to 60 non-stem students teaching them to program in Processing.

Lab Instructor, CS105: Intro to Computer Programming 1 (Fall 2015, 2016, 2017)
- Ran lab with up to 60 non-stem students teaching them to program in Processing.

Teaching Assistant, CS449/649: Human-Computer Interaction (Spring 2017)
- Graded and gave in-person feedback on semester-long HCI student projects.

Teaching Assistant, CS349: User Interfaces (Winter 2016)
- Graded assignments in Java and helped students in office hours.

Teaching Assistant, CS234: Data Types and Structures (Spring 2016)
- Graded data structures proofs and pseudo-code on assignments.

Teaching Assistant, CS116: Intro to Computer Science (Winter 2016)
- Graded weekly Racket and Python programming assignments.

2014
Carnegie Mellon University, Entertainment Technology - *Graduate Teaching Assistant*
Festival Teaching Assistant, BVW: Building Virtual Worlds (Fall 2014)
- Organized event to showcase students' work to over 500 industry guests.

2010 - 2012

University of Waterloo, Faculty of Mathematics - *Undergraduate Teaching Assistant*
Tutor, MATH138: Calculus 2 for Honours Math (Winter 2012)

Tutor, MATH135: Algebra for Honours Math (Fall 2011)

Tutor, MATH136: Linear Algebra 1 for Honours Math (Winter 2011)

Grader, MATH235: Linear Algebra 2 for Honours Math (Fall 2010)

scholarships and awards

NSERC Postgraduate Scholarship, Doctoral (PGS D), 2018-2021
$21,000/year scholarship based on research potential and academic merit.

Dinning - Wolf Endowed Regental Fellowship in Computer Science & Engineering, 2018
$25,000 fellowship based on academic merit.

Ontario Graduate Scholarship, 2017
$15,00 scholarship based on academic merit.

University of Waterloo President's Graduate Scholarship, 2017
$10,000 scholarship based on academic merit.

NSERC Postgraduate Scholarship, Masters (PGS M), 2014
$17,300 scholarship based on research potential and academic merit.

NSERC Canada Graduate Scholarship, Masters (CGS M), 2014
(cannot be held at international university, declined to accept PGS M)
$17,500 scholarship based on research potential and academic merit.

Ontario Graduate Scholarship, 2014
(declined to accept NSERC PGS M)
$15,000 scholarship based on academic merit.

Margaret A. Ryan Award, 2012
$100 for receiving top grade in french linguistics course.

NSERC Undergraduate Student Research Award, 2012
$4,500 based on academic merit.

University of Waterloo Women in Mathematics Scholarship, 2012
$1,000 awarded to top female undergraduate math student in academic year.

University of Waterloo, Faculty of Mathematics Semester Dean's Honours, Winter 2009 - Fall 2012

service

Organizing Committee: UIST Student Volunteer Co-Chair (2021)
Reviewer: CHI (2021), MobileHCI Late Breaking Work (2019)
Student Volunteer: UIST (2017, 2019)