THE UNIVERSITY OF BRITISH COLUMBIA
Curriculum Vitae for Faculty Members

Date: Aug 1, 2020
Initials: ckh

1. **SURNAME**: Heeren   **FIRST NAME**: Cinda
   MIDDLE NAME(S):

2. **DEPARTMENT/SCHOOL:** CPSC

3. **FACULTY**: Science

4. **PRESENT RANK**: Associate Professor of Teaching   **SINCE**: 07/01/2017

5. **POST-SECONDARY EDUCATION**

University or Institution	Degree	Subject Area	Dates
Stanford University	BS	Math & Computational Science	1990
Stanford University	MS	Operations Research	1990
University of Illinois	PhD	Computer Science	2004

Special Professional Qualifications

6. **EMPLOYMENT RECORD**

(a)   *Prior to coming to UBC*

University, Company or Organization	Rank or Title	Dates
University of Illinois, Urbana-Champaign	Teaching Professor	2016-2017
University of Illinois, Urbana-Champaign	Senior Lecturer	2012-2016
University of Illinois, Urbana-Champaign	Lecturer	2007-2012
University of Illinois, Urbana-Champaign	Visiting Lecturer and Director of Diversity Programs	2004-2007
University of Illinois, Urbana-Champaign	Graduate Research Assistant	1997-2003
University of California, Santa Barbara	Teaching Associate	1993

| California Polytechnic State University, San Luis Obispo | Lecturer | 1990-1993 |

1. Lecturer, Computer Science, Statistics, and Mathematics, California Polytechnic State University at San Luis Obispo, 1990-1993. Taught Automata Theory, Numerical Methods, Discrete Math, Introductory Statistics, and Calculus I.
2. Teaching Associate, Statistics, University of California, Santa Barbara, Spring 1993. Taught Stochastic Processes.
3. Graduate Research Assistant, Computer Science, University of Illinois, 1997-2003.
4. Visiting Lecturer, Computer Science, University of Illinois Summer 1998, 2004-2007.
5. Director of Diversity Programs, Computer Science, University of Spring 2004-Fall 2005. Developed outreach programs and processes, many of which are institutionalized within our Women in Computer Science organization.
6. Lecturer, Computer Science, University of Illinois 2007-2012.
7. Education Director, Data Sciences Summer Institute, 2007-2012. Developed and taught Foundations of Data Sciences, whose syllabus included an introduction to probability and linear algebra in the context of data mining/machine learning (4 summer semesters).
8. Senior Lecturer, Computer Science, University of Illinois 2012-present. Taught Discrete Mathematical Structures (6 semesters), Data Structures and Programming Principles (14 semesters), and Introduction to Programming for Non- Majors (2 semesters). Typical enrollment in current course: 600. Typical course rating: 4.7/5.0.

(b)   At UBC

Rank or Title	Dates
Associate Professor of Teaching	7/1/2017 - today

(c)   Date of granting of tenure at U.B.C.: 07/01/2017

7.   **LEAVES OF ABSENCE**

University, Company or Organization at which Leave was taken	Type of Leave	Dates

8.   **TEACHING**

(a)   Areas of special interest and accomplishments

(b)   Courses Taught at UBC

Session	Course Number	Total Scheduled Hours	Class Size	Total Weekly Hours Taught per Course			
				Lectures	Tutorials	Labs	Office Hours
2020S	221		185	3			4
2019W2	490-203		15	3			0
2019W2	221		176	3			4.5/2
2019W2	221		172	3			4.5/2
2019W1	221		99	3			4.5/2
2019W1	203		27	3			4.5/2
2019S	221		149	3			4
2018W2	221		182	3			4.5/2
2018W2	121		166	3			4.5/2
2018W1	221		112	3			4.5/2
2018W1	121		138	3			4.5/2
2018S	121		126	3			4
2017W2	221		223	3			4
2017W1	221		120	3			4.5/2
2017W1	320		117	3			4.5/2

(c)   Students Supervised (If Applicable)

At UBC:

Student Name	Program Type	Year		Supervisory Role (supervisor, co-supervisor, committee member)
		Start	Finish	
Oliver Zhang	CS Honours	09/17	04/18	Co-supervisor (with Estey)

At University of Illinois:

Student Name	Program Type	Year		Supervisory Role (supervisor, co-supervisor, committee member)
		Start	Finish	
Oliver Melvin	Sr Thesis	09/15	05/16	supervisor
Laura Licari	Sr Thesis	09/15	05/16	supervisor
Harsh Singh	Sr Thesis	09/14	05/15	supervisor
Matthew Joras	Sr Thesis	09/14	05/15	supervisor
Matthew Dierker	Sr Thesis	09/14	05/15	supervisor

Tom Bogue	Sr Thesis	09/14	05/15	supervisor
John Espinosa	Sr Thesis	09/14	05/15	supervisor
Brendan Ryan	Sr Thesis	09/13	05/14	supervisor
Suharsh Sivakumar	Sr Thesis	09/13	05/14	supervisor
Ciara Proctor	Sr Thesis	09/12	05/13	supervisor
Chase Geigle	Sr Thesis	09/12	05/13	supervisor
Jon Tedesco	MS Thesis	09/11	05/13	co-supervisor (Jiawei Han)
Jack Toole	Sr Thesis	09/11	05/12	supervisor
Charlie Meyer	MS Thesis	09/10	05/12	supervisor

1. Senior Thesis: Jack Toole, BS. Monad: An Educational Testing Framework, 2012.
2. Masters Thesis: Charlie Meyer, MS. CoMoTo: The Collaboration Modeling Toolkit, 2012.
3. Senior Thesis: Chase Geigle, BS. An Analysis of Inappropriate Collaboration in CS2, 2013.
4. Senior Thesis: Ciara Proctor, BS. Computing as a Tool of Inquiry for Middle School Students, 2013.
5. Masters Thesis: Jon Tedesco, MS. Influence in Heterogeneous Information Networks, 2013.
6. Senior Thesis: Suharsh Sivakumar, BS. BindiBot: a question-answering forum robot, 2014.
7. Senior Thesis: Brendan Ryan, BS. Visualizing the NYTimes Wedding Announcements, 2014.
8. Senior Thesis: John Espinosa, BS (co-advisor). Reminiscence in Social Media, 2015.
9. Senior Thesis: Tom Bogue, BS. Procedural Generation of Push Block Puzzles, 2015.
10. Senior Thesis: Matthew Dierker, BS. Interactive Display of Student Homes, 2015.
11. Senior Thesis: Matthew Joras, BS. Analysis of Autograding Systems, 2015.
12. Senior Thesis: Harsh Singh, BS. Automatic Readability, 2015.
13. Senior Thesis: Laura Licari, BS. Computer Security in MineCraft, 2016.
14. Senior Thesis: Oliver Melvin, BS. Crowd-sourced Video Transcription Alignment, 2016.

(d) *A summary of student evaluations of teaching effectiveness scores over the past five years (or since appointment if less than five years)*

Term	Course	SEOT overall effectiveness
2020S	CPSC221	4.8
2019W2	CPSC221	4.2
2019W2	CPSC221	4.4
2019W1	CPSC221	4.7
2019W1	CPSC203	4.0
2019S	CPSC221	3.9
2018W2	CPSC221	4.6
2018W2	CPSC121	3.9

2018W1	*CPSC221*	*4.4*
2018W1	*CPSC121*	*4.4*
2018S	*CPSC121*	*3.3*
2017W2	*CPSC221*	*4.3*
2017W1	*CPSC320*	*4.2*
2017W1	*CPSC221*	*4.6*

(e)   Continuing Education Activities

(f)   Visiting Lecturer (indicate university/organization and dates)

(g)   Other

9.   EDUCATIONAL LEADERSHIP

(a)   Areas of special interest and accomplishments in educational leadership

PrairieLearn (PL) is an open-source web-based assessment platform developed by faculty at UIUC. A fortunate chain of events, begun in Winter, 2019, and accelerated by Moyra Ditchfield (Director of Computing and Facilities in the UBC CS department), seeded the opportunity of building a user community of PL at UBC. Of course, I was quick to jump in, because I had been a novice user of PL at UIUC (2015-2016).

Integration of new learning technology at a campus level requires development along several axes. The Faculty of Science, via the technical staff in the Department of Computer Science, has ensured that the PL platform is robust from both a performance and privacy standpoint. Their continued support in the form of a 75% FTE is a testament to the long-term enthusiasm for PL at the Faculty level. *My* role is to generate the interest and expertise for PL adoption among instructors from diverse departments, and to offer technical support, training, and mentoring as they migrate their content onto the platform.

To date, and together with Paul Carter (Associate Head CS) and Ditchfield, we have secured TLEF funding to support content migration for approximately seven courses over 2020-2021. So far, five courses in CS are planning to use the platform in Winter, 2020. There is significant active interest in adoption from many departments, including Math, EOAS, Physics, Bio, Chem, Mech (APSC), and ECE (APSC). In the summer of 2020, a team of seven TAs, funded by our TLEF and supervised jointly by me and a course instructor, are building questions for five courses both within and outside CS. If the trajectory of PL at UBC matches that of UIUC, we will have thousands of students using the platform within a very short time.

The magic and appeal of PL lies in its extreme ability to randomize questions, and in its great variety of question types. Instead of writing an assessment as a list of static questions, instructors focus their efforts on writing question *generators* which are closely linked to the learning objectives of a course, and which

induce so much randomness that they can be re-deployed over many semesters. The analytics resulting from such consistent assessments are a firm basis for evaluating instructional interventions, and in my class I foresee robust benchmarked studies on instructional adaptations such as mastery learning, and group exams.

The biggest one-time roadblock to PL adoption is content migration and question development. To address this challenge, a vital community of practice is a necessity, and I will continue serving as a host and advocate inside that community as long as PL is an effective tool for assessment of student learning at UBC.

(b)   Curriculum development/renewal

CPSC203 – Problem Solving, Programming, and Algorithms. I built the entire course from early ideation through course proposal and materials design. Development was supported by a Skylight Development Grant, and CS-CWSEI funds. The first offering occurred 2019W1.

CPSC203 is a second course for non-cs majors. Its intent is to give students experience solving increasingly complex problems with code (Python), while at the same time developing their ability to describe and analyze the problems using abstractions. The problems we have chosen are rich, diverse, and interconnected, with applications in the arts and sciences. To our knowledge, the syllabus for this course is unique--no similar course exists.

Course highlights:
- The classroom portion of the course is based upon six explorations whose application areas include handcraft, the Billboard Hot 100 song list, mapping your nearest Tim Horton's, algorithmic music generation, Harry Potter's social network, and the description of world flags.
- Four projects expand on the classroom explorations into web scraping, algorithmic art, Conway's *Game of Life*, and bird migration using open street maps.
- Programming skills and fluency are exercised via a collection of small daily exercises referred to as the POTD (problems of the day). Approximately 50 of these are completed over the term.

The course is a follow-on course for CPSC103, though most introductory CS courses provide adequate preparation.

(c)   Pedagogical innovation (chronologically within courses, since arriving at UBC)

CPSC221
    2017W1
- Modernized course website
- Reworked and repositioned 10 lab assignments (With Lynn Zhang)

- Created self-reflection modules for 10 labs (With Oliver Zhang)

2017W2
- Increased number of assessments to 3 homework, 4 programming assignments, and 2 midterm exams. (4th programming assignment subsequently removed)
- Devised "Sustainable Programming Assignment Design" to facilitate future assignment development, and then used that framework to deploy 4 novel and engaging programming projects.
- Templatized homework assignments.
- Incorporated Catch2, a modern, open-source testing framework for C++.

2018W1
- Built a course autograder for deployment on Gradescope, and then used that infrastructure for all student programming assignment submission.
- Developed and executed a C++ minicamp at start of semester, which is now part of course standard operating procedure.
- Devised "Exam Visitations" wherein students revisit exam questions under the guidance of experts. Capitalizes on engagement. Participation was ~10%.

2018W2
- Piloted a "creative component" in a single programming assignment, wherein students devised their own flood-fill pattern and submitted it publicly through piazza.
- Developed algorithm visualizations to support instruction (student work supported by UBC Library grant).
- Began adapting an open-source textbook specifically for 221.

2019S
- Developed and piloted html5-based interactive annotated lecture slides. (since abandoned, based on student feedback)

2019W2
- Developed weekly practice assessments and lab quizzes delivered via PrairieLearn.
- Continued development of an open-source textbook specifically for 221.
- Developed and deployed an online Final Exam using PrairieLearn (with Andy Roth). Will be adapted and deployed in perpetuity.

2020S
- Moved all course assessments into PrairieLearn and developed many problem generators tied to course learning objectives.
- Created video media for all course content.
- Piloted community activities to support belonging in online learning environments.

CPSC203--2019W1:
- Developed and deployed ~30 "Problems of the Day," which are small programming problems whose intent is to build fluency through daily practice (with Eylul Aygun).
- Created all course content, including classroom narrative and exercises, projects, website, and assessments.

CPSC320--2017W1: Added strategic classroom exercises that enhanced existing worksheets

CPSC121--2018S, 2018W1, 2018W2: Added many active-learning components to existing presentations.

(d)   Applications of and contributions to the scholarship of teaching and learning

(e)   Teaching and Learning Grants

UBC Small TLEF Innovation Award: $24,480, in support of PrairieLearn content development. 02/20.

UBC OER Rapid Innovation Grant: $1500, ongoing support for open textbook development. 04/20.

UBC Skylight Development Grant: $2000, in support of CPSC203 development. Augmented by CSWEI funds from CS to $10000. 07/18.

Open Textbook OER Project, UBC Library, $3000 for student support. 05/18.

AWARE: Accelerating Women and underRepresented Entrepreneurs, NSF, Advisory Board. PIs: Taylor, Bleill, Singer, Frerichs. 2015-2016. $100,000. 05/16

EI: Learning Trajectories for Integrating K-6 Computer Science and Mathematics, NSF Stem+C, co-PI. Co-PIs: Isaacs, Israel, Reese. 2015-2018.

Scaling cultures of collaboration: Evidence-based reform in portal STEM courses, NSF DUE Widening Implementation & Demonstration of Evidence-based Reforms, senior personnel. PIs: Mestre, Greene, Herman, Tomkin, West. 2014-2017. $2,000,000.

Teaching Computing at Scale, UIUC College of Engineering Strategic Instructional Improvement Program, co-PI. Co-PIs: Zilles, Pitt, Fleck, Angrave. 2011-2014, $450,000.

Visual Parallelism for Data Structures, NSF IEEE-TCPP Curriculum Initiative on Parallel and Distributed Computing, PI. 2012. $3000.

Tablet PCs for Monitoring Large Engineering Classes, UIUC Grants for the Advancement of Teaching Engineering, co-PI. Co-PI: Kamin. 2010. $20,000

CoMoTo: a Collaboration Monitoring Tool, UIUC Grants for the Advancement of Teaching Engineering, co-PI. Co-PI: Shaffer. 2010. $20,000

Evaluating Pedagogy, UIUC Grants for the Advancement of Teaching Engineering, co-PI. Co-PI: Zilles. 2008. $25,000

Multimodal Information Access and Synthesis: a DHS Center of Excellence, senior personnel. PI: Roth. 2006-2009. $2,000,000.

An Immersive Introduction to Computer Science, UIUC Grants for the Advancement of Teaching Engineering, co-PI. Co-PI: Pitt. 2007. $25,000

Concept Inventories for Computer Science, NSF CCLI, co-PI. Co-PIs: Zilles, Goldman, Loui, Kaczmarczyk. 2006-2009. $600,000.

Building Diversity in Computer Science, NSF DUE, senior personnel. PI: Kamin. 2004-2009. $1,000,000.

Tablet PC Award, Hewlett Packard, senior personnel. PI: Kamin. 2004. $87,500.

Learning Communities in Discrete Mathematics, UIUC Provost's Initiative for Teaching Advancement, PI. 2004. $6750.

(f)   Formal educational leadership responsibilities

(g)   Innovation in the use of learning technology

Learning Technology Design and Development:
- *The Workbook – a web application that makes data exploration accessible to novice programmers. Key features: students can easily add their own Python analysis modules and data visualizations.*
- *Monad – a software testing framework designed specifically for evaluating student code submissions. Key features: incremental compilation and meaningful student feedback (with Toole).*
- *Romdo – a command-line grade maintenance tool that replaced the horrible campus blackboard system. Key features: easy interface with autograders; api allows for flexible access; fast (with Toole).*
- *Chara – a web-based open lab queuing system that allows students to take a number when requesting assistance. Key features: used to collect data on student access patterns and quality of teaching interactions (with Geigle).*
- *CoMoTo – the Collaboration Monitoring Toolkit. A wrapper for MOSS that also pulls student data from university resources. Key features: maintains complete history of student submissions; data visualization helps detect inappropriate collaboration (with Meyer).*
- *ProMoTo – a web-based student performance visualization tool that sits on top of Romdo. Key features: gives secure access to current grades. Allows students to speculate on future performance and set goals. Helps instructor diagnose and identify at-risk students (with Jeffrey Tolar).*
- *The Queue -- web-based queuing system used to orchestrate office hours. Features grouping by topic and TA feedback on student preparedness (with Geigle).*

(h)   Other educational leadership contributions

10. **SCHOLARLY AND PROFESSIONAL ACTIVITIES**

(a) *Areas of special interest and accomplishments*

(b) *Invited Presentations (Identify whether International/National/Local)*

- CMD-f Keynote Address. March 7, 2020. "*Parametric Curves.*" (LOCAL)
- Academy for Excellence in Engineering Education, Spring 2019, Distinguished Lecture. University of Illinois. March 26, 2019. "*The Art, Craft, and Practice of Teaching.*" (INTERNATIONAL)
- CMD-f Keynote Address. March 10, 2019. "*Redefining the Base Case in the History of Computing.*" (LOCAL)
- Women in Engineering Seminar, Guest Lecture, University of Illinois. October 2018. (INTERNATIONAL)
- Invited Lecture, CS@Illinois. May 5, 2017. "*Strongly Connected Components.*" (LOCAL)
- Keynote Speaker, Women In Computer Science Awards Banquet. April 27, 2017. "*The only thing that we could have a little more of the same kind words and the answers are very very important.*" (LOCAL)
- Keynote Speaker, ECE PULSE Student Conference. March 6, 2017. "*Snowflakes: A Riff on Innovation.*" (LOCAL)
- Video Contributor, Illinois Emerging Technology Report, University of Illinois at Urbana-Champaign, January, 2015. (LOCAL)
- Video Contributor, "*Teaching Wirelessly with Tablets,*" University of Illinois at Urbana-Champaign, January, 2015. (LOCAL)
- Invited Speaker, "*CS@Illinois Recruiting and Retention,*" Workforce Diversity Summit, Mountain View Chamber of Commerce, Mountain View, CA, February, 2015. (NATIONAL)
- Invited Speaker, "*CS: Who Wouldnt Love It?*" NCWIT Central Illinois Aspirations in Computing Award Ceremony, University of Illinois, April, 2015. (LOCAL)
- Invited Speaker, "*Celebrating Ada,*" Champaign-Urbana Women in Technology, University of Illinois Research Park, October, 2015. (LOCAL)
- Video Panelist, "*Video Vignettes, Innovations, and Conversations,*" Annual Faculty Retreat, University of Illinois at Urbana-Champaign, February, 2014. (LOCAL)
- Invited Speaker, "*Active Learning,*" College of Business Teaching Academy, University of Illinois at Urbana-Champaign, October, 2014. (LOCAL)
- Instructor, "*Foundations of Data Science.*" Pan-American Advanced Studies Institute on Methods in Computational Discovery for Multidimensional Problem Solving; Universidad del Valle, Guatemala, July, 2013 (NSF OISE 1242216; PI: Marshall Scott Poole). (INTERNATIONAL)
- Selected Attendee, National Academy of Engineering, Frontiers of Engineering Education Symposium, Irvine, CA, October, 2013. (NATIONAL)

- Video Contributor, "*Best Practices and Advice for Teaching Large-enrollment Classes: Engaging Students and Keeping Their Attention*," Mark Micales Distinguished Teacher Scholar Project, University of Illinois at Urbana-Champaign, February, 2012. (LOCAL)
- Panelist, "*Academic Integrity: Values and Vision for a Modern University*," Ethics Awareness week, University of Illinois at Urbana-Champaign, October, 2012. (LOCAL)
- Curriculum presenter, UIUC/ROE Novice Teacher Support Program, 2004. (LOCAL)

(c)   Other Presentations

(d)   Other

(e)   Conference Participation (Organizer, Keynote Speaker, etc.)

- Canada Celebration of Women in Computing, Workshop on Inclusive Teaching, small group facilitator, Toronto, ON, November, 2019.

- Canada Celebration of Women in Computing, Panel on Implicit Bias, small group facilitator, Toronto, ON, November, 2019.

- Computing Research Association-Education, Academic Careers: The Landscape is Broader than You Think, panelist, Phoenix, AZ, June 2019.

- Grace Hopper Celebration of Women in Computing, Leading Intentional Cultural Change, panelist, Houston, TX, September 2018.

- Western Canadian Conference on Computing Education, attendee, University of Victoria, May 2018.

11.   **SERVICE TO THE UNIVERSITY**

(a)   Areas of special interest and accomplishments

(b)   Memberships on committees, including offices held and dates

(At UBC)
Department of Computer Science:
- Peer Evaluation, 2018-2019
- CODE, 2019, Chair
- Faculty Recruiting: Educational Leadership, 2017-2018
- Promotion Mini-Committee, Meghan Allen, 2018
- Undergraduate Operations, 2017

- BCS Admissions, 2017

(at University of Illinois)
Department of Computer Science:
- Governance Committee, 2015-2017
- Outreach Committee, 2015-2017
- Scaling Committee, 2013-2014
- Student Awards Committee, 2012-2015
- Teaching Evaluation and Improvement, 2012-2013
- Undergraduate Curriculum Reform, 2011-2013

College of Engineering:
- Climate Task Force, 2015
- Undergraduate Computing Education Committee, 2014

Campus:
- Teaching Advancement Board, 2014-2016

(c)   *Other service, including dates*

At UBC:
- 03/2020 cmd-f student led hackathon (judge + keynote)
- 02/2020 Women in Science "Meet the Prof" (guest)
- 02/2020 BizHacks student led hackathon (judge)
- 01/2020 NWHacks student led hackathon (judge)
- 11/2019 Local Hack Day (judge)
- 09/2019 Welcome to Combined Sciences Students (CS representative)
- 08/2019 Jump Start Frosh Orientation
- 03/2019 cmd-f student led hackathon (judge + keynote)
- 02/2019 xDHacks student led hackathon (judge)
- 01/2019 NWHacks student led hackathon (judge)
- 09/2018 Welcome to Combined Sciences Students (CS representative)
- 01/2018 NWHacks student led hackathon (judge)
- 11/2017 GirlSmarts4Tech Parent Panel at SAP (panelist)
- 08/2017 "Ada's Music" presentation to UBC Gearing Up summer camp (x2)

At University of Illinois:
- 2004-2017 Women in Computer Science (WCS), student organization (facutly advisor)
- 2010-2017 Association for Computing Machinery (ACM), student organization (faculty advisor)
- 2015-2017 Promoting Undergraduate Research in Engineering (PURE), student organization (faculty advisor)

- 2005-2012 Girls Engaged in Math and Science (GEMS), NCSA middle school day camp (advisor)
- 2013-2017 Girls Engaged in Math and Science (GEMS), CS@Illinois middle school day camp (director)
- 04/2014, 03/2015 HackIllinois, student-run event (judge)
- Spring, 2014 Pebble Smartwatch Education Program for CS@Illinois. Secured donation of 2000 watches for distribution to the undergraduate community and arranged subsequent education and celebratory events (organizer)
- 2012 ACM Outreach at Tap-In Academy, after school program (facilitator)
- 05/2011 The Prairie Project: Infusing Sustainability Across the Illinois Curriculum (participant)
- 2010 Birds-of-a-Feather: Discrete Math, SIGCSE (co-organizer)
- 2010 Regional Aspirations in Computing Award, NCWIT (judge)
- 2004-2005 Building Communities: Recruiting and Retention in CS, NSF (director)
- 2005 UIUC Regional Celebration of Women in Computing (director/host)
- 2005 The UIUC ChicTech Project: Recruiting and Retention, Grace Hopper Celebration of Women in Computing (panel organizer)

12. <u>SERVICE TO THE COMMUNITY</u>

(a)   Memberships on scholarly societies, including offices held and dates

(b)   Memberships on other societies, including offices held and dates

(c)   Memberships on scholarly committees, including offices held and dates

(d)   Memberships on other committees, including offices held and dates

(e)   Editorships (list journal and dates)

(f)   Reviewer (journal, agency, etc. including dates)

- BOF/Workshop Reviewer SIGCSE Technical Symposium on CS Education, 11/2018

(g)   External examiner (indicate universities and dates)

(h)   Consultant (indicate organization and dates)

(i)   Other service to the community

MEDIA/INTERVIEWS:

1. *ChicTech Hopes More Women Jump into Tech*, The Daily Illini, http://www.dailyillini.com/article/2004/12/chictech-hopes-more-women-jump-into-tech, December 6, 2004.
2. *Gender Bias Not as Strong in Today's Job Market*, The Daily Illini, http://www.dailyillini.com/article/2005/09/gender-bias-not-as-strong-in-todays-job-market?mode=jqm, September 13, 2005.
3. *The Story of Jobs Resonates Even After His Passing*, The Daily Illini, http://www.dailyillini.com/article/2011/10/the-story-of-jobs-resonates-even-after-his-passing?mode=jqm, October 10, 2011.
4. *Camp Takes Students Beyond Computer Science*, The News-Gazette, http://www.news-gazette.com/news/local/2013-06-27/camp-takes-students-beyond-computer-science.html, June 27, 2013.
5. *Guest Lecturer to Reveal Intersection of Science, Creativity, Communication*, The Daily Illini, http://www.dailyillini.com/article/2014/04/guest-lecturer-to-reveal-intersection-of-science-creativity-communication, April 9, 2014.
6. *Pebble Smart Watch Allows Students Hands-Free Communication*, The Daily Illini, http://www.dailyillini.com/article/2014/05/pebble-smart-watch-allows-students-hands-free-communication, May 6, 2014.
7. *Camp at UI Aims to Get Girls Focused on Computing*, The News-Gazette, http://www.news-gazette.com/news/local/2014-06-28/camp-ui-aims-get-girls-focused-computing.html, June 28, 2014.
8. *Computers Now and Then*, The Daily Illini, http://www.dailyillini.com/article/2014/09/computers-now-and-then, September 9, 2014.
9. *Hacking Her Way In: Computer Science No Longer Just a Mans World*, The News-Gazette, http://www.news-gazette.com/news/local/2014-09-21/hacking-her-way-computer-science-no-longer-just-mans-world.html, September 21, 2014.
10. *Parisa Tabriz: Security Princess, Hacker, Role Model, The Daily Illini*, http://www.dailyillini.com/article/2015/03/parisa-tabriz-security-princess-hacker-role-model, March 2, 2015.
11. *Computer Science Through the Lens of Art, Games, and Fashion*, Smile Politely, http://www.smilepolitely.com/tech/computer_science_through_the_lens_of_arts_games_and_fashion/, April 28, 2015.

13.   AWARDS AND DISTINCTIONS

(a) Awards and nominations for Teaching awards (indicate name of award, awarding organizations, date)

- Killam Teaching Prize, UBC, May, 2020.

- Teacher of the Year, Illinois-Indiana Section of the American Society of Engineering Education, June, 2015.
- Incomplete List of Teachers Ranked as Excellent by their Students, University of Illinois, 8 consecutive semesters, 2011-2017.
- Teaching Academy Fellow, Academy for Excellence in Engineering Education, College of Engineering, University of Illinois, 2014-2015.
- Rose Award for Teaching Excellence, College of Engineering, University of Illinois, February, 2014.
- Distinguished Alumni Educator Award, Department of Computer Science, University of Illinois, October, 2014.

(b)   Awards for Scholarship (indicate name of award, awarding organizations, date)

(c)   Awards for Service (indicate name of award, awarding organizations, date)

(d)   Other Awards

- University of Illinois 150 for 150 – celebrating the accomplishments of women at the University of Illinois. Awarded March, 2018. https://gec150.web.illinois.edu

14.   OTHER RELEVANT INFORMATION (Maximum One Page)

THE UNIVERSITY OF BRITISH COLUMBIA
Publications Record

If Applicable – not required in the Educational Leadership Stream

SURNAME: Heeren   **FIRST NAME**:   Cinda   **Initials**: ckh
                             MIDDLE NAME(S):   **Date**: 8/1/2020

1.   REFEREED PUBLICATIONS

(a)   Journals

Crenshaw TL, Chambers EW, Heeren C and Metcalf HE (2017) <u>Ten Years toward Equity: Preliminary Results from a Follow-Up Case Study of Academic Computing Culture</u>. Frontiers in Psychology. 8:816.

Ken Goldman, Paul Gross, Cinda Heeren, Geoffrey Herman, Lisa Kaczmarczyk, Michael Loui, Craig Zilles, <u>Setting the Scope of Concept Inventories for Introductory Computing Subjects</u>, ACM Transactions on Computing Education, Vol. 10 Issue 2, Article 5, 2010.

(b)   Conference Proceedings

Patrice Belleville, Steven A. Wolfman, Susanne Bradley, Cinda Heeren. <u>Inverted Two-Stage Exams for Propective Learning</u>. In Proceedings of the 51st ACM Technical Symposium on Computer Science Education (SIGCSE '20).

Heather E. Metcalf, Tanya L. Crenshaw, Erin Wolf Chambers, and Cinda Heeren. <u>Diversity Across a Decade: A Case Study on Undergraduate Computing Culture at the University of Illinois</u>. In Proceedings of the 49th ACM Technical Symposium on Computer Science Education (SIGCSE '18).

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S. Massung, C. Heeren, <u>Visualizing Parallelism in CS2</u>, in Proceedings of the 27th IEEE International Parallel and Distributed Processing Symposium (IPDPS 2013), 1252-1256.

C. Meyer, C. Heeren, E. Shaffer, and J. Tedesco, <u>CoMoTo: the collaboration modeling toolkit</u>, ACM Conference on Innovation and Technology in Computer Science Education (ITiCSE 2011), 143-147.

K. Goldman, P. Gross, C. Heeren, G. Herman, L. Kaczmarczyk, M. Loui, and C. Zilles, <u>Identifying important and difficult concepts in introductory computing courses using a Delphi process</u>, 2008 Special Interest Group on Computer Science Education (SIGCSE 2008).

V. Almstrum, C. Heeren, P. Henderson, V. Harvey, W. Marion, C. Riedesel, L. Soh, and A. Tew, <u>Working group report on concept inventories in discrete mathematics</u>. 2006 ACM Conference on Innovation and Technology in Computer Science Education (ITiCSE 2006).

C. Heeren and L. Pitt, <u>Maximal boasting</u>, 2005 ACM International Conference on Knowledge Discovery in Data Mining (KDD2005).

J. Elbe, C. Heeren, L. Pitt, <u>Optimized disjunctive association rules via sampling</u>, 2003 IEEE International Conference on Data Mining (ICDM03).

C. Heeren, H. V. Jagadish, and L. Pitt, <u>Optimal indexing using near-minimal space</u>. 2003 ACM Symposium on Principles of Database Systems (PODS03).

(c)   Other

2.   <u>NON-REFEREED PUBLICATIONS</u>

(a)   Journals

(b)   Conference Proceedings

(c)   Other

3.   BOOKS

    (a)   Authored

    (b)   Edited

    (c)   Chapters

    (d)   Contributions

<u>Women and Ideas in Engineering: Twelve Stories from Illinois</u> by Angela S. Wolters and Laura D. Hahn. August, 2018. I wrote side-bar commentary for the section on computing.

4.   SPECIAL COPYRIGHTS

5.   ARTISTIC WORKS, PERFORMANCES, DESIGNS

I am not an artist, but I wish I were. The little pieces below arose out of experimentation with new technology, and a need to create narratives of innovation to share with students.

Spiro, 2020: These images represent an animated work of art I generated as part of a keynote address to a women*'s hackathon. Shortly before the event, a student asked if I would please include mention of Katherine Johnson, the NASA mathematician who had recently passed away. I used the mathematics behind her work, and her life's story, as the basis for the entire talk. Her primary contribution--parametric computation of orbits--parallels the mechanics of "Spirograph" the art toy, so I programmed spirograph and used it to create the animated piece, sampled below after 1 minute and again after about 3 minutes.
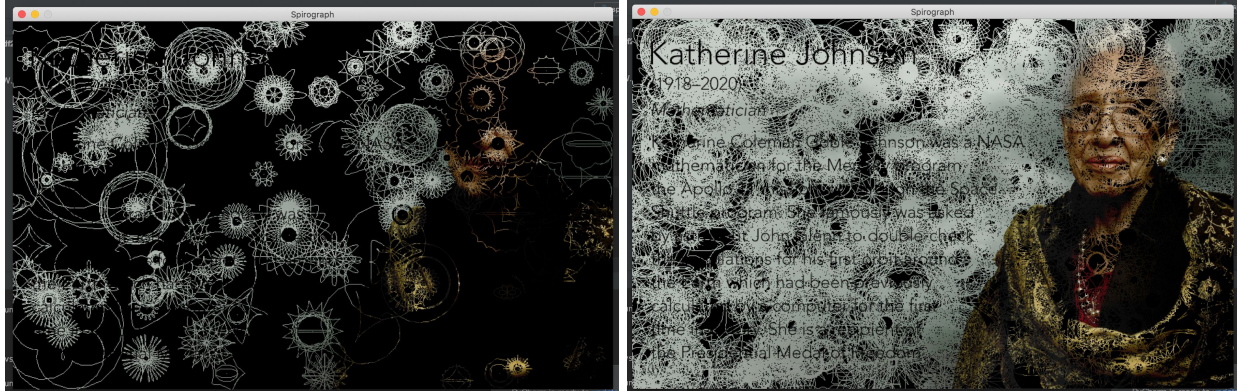
Snowflakes, 2017: In the winter of 2017 I was dazzled by some photographs of snowflakes taken by a friend, and wondered if I could replicate them programmatically. Below are some samples of the results. They are generated randomly, and no two are alike. I used my artistic journey as a metaphor upon which I built a talk about technical innovation for ECE-PULSE, 2017, a student-run conference at UIUC.
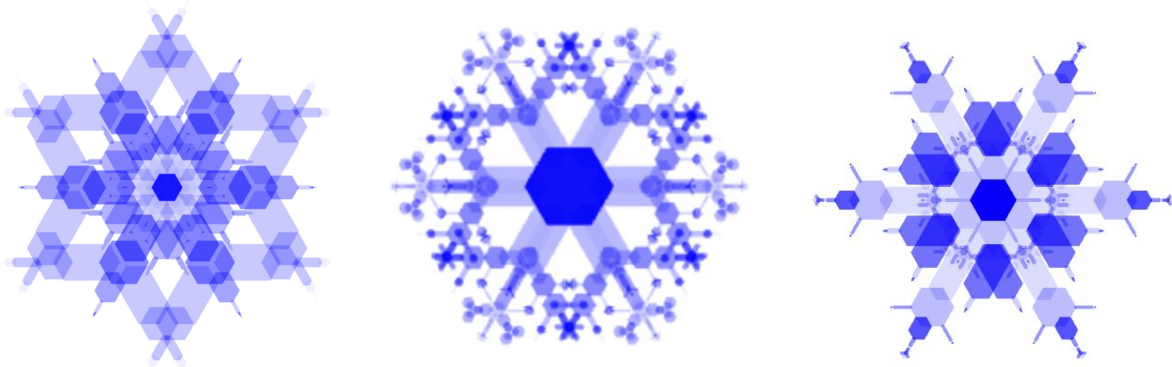
Kali, 2015: As background work before changing the programming infrastructure on which my course was built, I learned a new graphics library by creating an animated kaleidoscope based upon an image. The red triangle on the bottom bounds the region replicated in the kaleidoscope. The kaleidoscope varies as the triangle rotates on the bottom image, giving a mesmerizing effect.

TriSpiral, 2012: This fractal image was created just for fun, when I was piloting the Khan academy javascript interface for use in a summer camp for middle school girls. In its online form, it is an animated illustration of recursion.
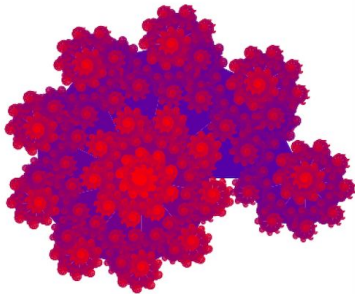
6.   OTHER WORKS

7.   WORK SUBMITTED (including publisher and date of submission)

8.   WORK IN PROGRESS (including degree of completion)