Serina Chang

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EDUCATION

Stanford University, Palo Alto, CA **Sep 2019-**
Ph.D., Computer Science

Columbia University, Columbia College, New York, NY **Sep 2015-May 2019**
B.A., *magna cum laude,* Computer Science, concentration in Sociology GPA: 3.97
Honors: Phi Beta Kappa, Dean's List (all semesters), Theodore R. Bashkow Award, Computer Science Academic Excellence Award

Hunter College High School, New York, NY **Sep 2009-Jun 2015**

RESEARCH INTERESTS

My research interests lie at the intersection of computer science (CS) and social science, as I aim to develop new computational methods that can model and detect social phenomena from unstructured text. Keywords: natural language processing, computational social science, machine learning

FELLOWSHIPS & AWARDS

Outstanding Undergraduate Researcher Award, Computing Research Association. **2019**
Recognizes undergraduate students in North American colleges and universities who show outstanding research potential in an area of computing research.

Graduate Research Fellow, National Science Foundation **2019**

Theodore R. Bashkow Award, Columbia University, Computer Science. *Presented to a Computer Science senior who has excelled in independent projects.* **2019**

King's Crown Leadership Award, Innovation and Enhancement, Columbia University. **2018**
Recognizes students who have made significant contributions to the Columbia community.

Collegiate Award Finalist, National Center for Women and Information Technology. **2018**
Honors the outstanding computing accomplishments of undergraduate and graduate women.

PUBLICATIONS

S. Chang and K. McKeown. "Automatically Inferring Gender Associations from Language." *Empirical Methods in Natural Language Processing* (EMNLP) 2019, submission under review.

S. Chang, R. Zhong, E. Adams, F. Lee, S. Varia, C. Kedzie, D. Patton, W. Frey, and K. McKeown. "Detecting Gang-Involved Escalation on Social Media Using Context." *EMNLP* 2018. Long Paper and Oral Presentation, 10.2% acceptance rate. http://aclweb.org/anthology/D18-1005.

J. Ouyang, **S. Chang**, and K. McKeown. "Crowd-Sourced Iterative Annotation for Narrative Summarization Corpora." *European Association for Computational Linguistics* (EACL) 2017. Short Paper and Oral Presentation, 9.3% acceptance rate. http://aclweb.org/anthology/E17-2008.

RESEARCH EXPERIENCE

Undergraduate Senior Thesis | Advised by Prof. Kathleen McKeown, Fall 2018 & Spring 2019

Constructed two datasets: one drawing from celebrity news and the other from student evaluations of CS professors. Designed methods to automatically infer gender-associated words and labeled clusters; applied methods to datasets to derive and compare novel findings from both domains.

Argumentation Mining | Advised by Prof. Smaranda Muresan, Spring 2019

Developed a bidirectional LSTM to automatically segment text into argumentative discourse units; this is the first step in automatically mining argumentative content and structure from unstructured text.

Class Project | Foundations of Graphical Models (D. Blei), Fall 2018

Designed probabilistic machine learning models to automatically detect topics and infer relations between users in a large unlabeled corpus of Twitter posts by gang-involved youth in Chicago.

Detecting Gang-Involved Escalation | Advised by Prof. Kathleen McKeown, Spring 2018

Built a CNN to automatically detect Aggression and Loss in Twitter posts by gang-involved youth; these emotion signals can help community organizations identify and prevent potential violence.

Class Project | NLP in Context: Computational Models of Social Meaning (S. Muresan), Spring 2018

Automated the Bechdel test using features such as linguistic frames and social network metrics; performed better than the state-of-the-art on two of the steps and comparably on the overall task.

Automatic Text Summarization | Advised by Prof. Kathleen McKeown, Summer & Fall 2016

Utilized Amazon Mechanical Turk to iteratively annotate a corpus of aligned abstractive and extractive summaries; enables the development of text-to-text summary generation systems.

PRESENTATIONS

Invited talk, Columbia University, NLP at Columbia, "Automatically Inferring Gender Associations from Language" **May 2019**

Poster presentation, Columbia University, Days on Campus Science Research Symposium, "Automatically Inferring Gender Associations from Language" **Apr 2019**

Workshop presentation, NYC Digital Humanities Week, "Beyond Bechdel: Using Computation to Analyze Gender in Film" **Feb 2019**

Oral presentation, *EMNLP* 2018 (Brussels, Belgium), "Detecting Gang-Involved Escalation on Social Media Using Context" **Oct 2018**

Invited talk, Columbia University, Emerging Scholars Program, "Natural Language Processing and Computational Social Science" **Apr 2018**

WORK EXPERIENCE

Software Engineering Intern, Google, Geo Assistant, New York, NY, Summer 2018

- Built a new user-facing feature for Google Search and Assistant; developed feature from end-to-end
- Designed logic to recognize and parse natural language queries related to the feature, implemented checks in Search (largest binaries at Google) to optimize precision and recall on the feature's triggering patterns, worked with UX designer and PM to create frontend for the feature

Engineering Practicum Intern, Google, Search Frontend SRE, Mountain View, CA, Summer 2017

- Modified Search architecture to add new tracking metrics for requests; used these metrics to improve the primary monitoring console for Google Now
- Completed stretch projects that enhanced the functionalities of company-wide monitoring tools

TEACHING

Instructor | Girls Who Code, Summer Immersion Program, Summer 2019 (incoming)
Teaching a 7-week curriculum to a class of high school girls. Introducing them to Python, data science, robotics, web development, coding design, and other concepts; overseeing their final technical projects.

Instructional Assistant | Columbia University, Data Structures in Java, Spring & Fall 2017
Led discussion sections, held weekly office hours, and graded assignments and exams.

Writing Coach | Hunter College High School, Writing Center, 2013-2015
Selected by faculty to help peers develop and edit their writing assignments for English, Social Studies, and Science classes.

Math Peer Tutor | Hunter College High School, Library & Resources, 2013-2014
Recommended by faculty in the extended honors math program to tutor a classmate in honors math.

PROJECTS

FinalMile | Columbia Impact Solvathon, Citi Ventures Challenge (Second Place), Sep 2017

Worked with team to build a platform to facilitate aid to disaster-struck areas. I formulated package delivery as an AI search problem and implemented an algorithm to optimize delivery efficiency.

in memoriam | Monthly Music Hackathon, Jan 2017

Worked with a partner to write an electronic piece that represents U.S. mass shootings data and helps listeners comprehend the severity of events. I designed a system to automatically generate portions of the piece by parsing shootings data and translating data points into musical notes.

RELEVANT COURSEWORK

Computational: Natural Language Processing, Machine Learning, Artificial Intelligence, NLP in Context: Computational Models of Social Meaning, Foundations of Graphical Models, Analysis of Algorithms I, Advanced Programming, Computer Science Theory, Fundamentals of Computer Systems, Data Structures in Java, Honors Introduction to Computer Science, Discrete Math, Linear Algebra, Calculus III

Social Science: Sociology of Work and Gender, Global Activism, The Social World, Social Theory, Methods of Social Research, Thinking and Decision Making, Proseminar in Sociology

COMMUNITY LEADERSHIP

Lean In at Columbia, Co-President, 2017-2018
Empowering women of all disciplines and identities to lean into their lives.

- Grew active membership by 5x to reach over 100 committed members who attend weekly circle meetings; expanded larger club community to hundreds who attend and support monthly events
- Founded a mentorship program that connected over 70 students to young professionals in the city
- Organized the first Lean In at CU conference, sponsored by Microsoft, Facebook, IBM, and others

- Launched collaborations with Columbia Center for Career Education, the Columbia College Women alumni network, and other leading clubs on campus such as Columbia Organization of Rising Entrepreneurs (CORE) and Women in Law and Politics (WILP)
- Connected with international Lean In network; advised new Lean In chapters at other universities
- Initiated and moderated two Lean In Circles, one focused on interdisciplinary interest and the other on LGBTQ identity; also trained three classes of new circle moderators

Womxn in CS (WiCS) at Columbia, Academic Chair, 2017-present
Bringing together the Columbia community in support of the advancement of women and non-binary individuals in CS.

- Facilitated relationship between WiCS and CS faculty at Columbia, inviting them as panel speakers for academic events and organizing lunches for students to enjoy more face-time with faculty
- Founded WiCS Lightning Talks, a research series for students and by students, creating a platform for diverse student researchers to give short talks on their research to an audience and, in turn, inspire their peers to dive into research

Intercollegiate Chamber Music Festival, Co-Founder and Producer, 2016-present
Celebrating collegiate musicians as musicians and academics, and leveraging their unique positions to open discussion about being ambassadors and critics of the classical music world.

- Founded in collaboration with Chamber Music Society of Lincoln Center
- Cultivated partnerships with nearby universities, including Williams, Harvard, Princeton, MIT, Yale, and NYU to recruit chamber ensembles and audience interest
- Produced all events of the festival, including concerts at Lincoln Center, dress rehearsals, master classes with guest artists, lightning talks, and social events for participants
- Earned financial grants from Columbia, managed fundraising and budgeting

ADDITIONAL INTEREST – CLASSICAL MUSIC

YouTube Channel: https://www.youtube.com/channel/UC-ZZIpMYSovs0ulOxYhI5BA

Education: Columbia Music Performance Program (MPP), 2015-2019; Manhattan School of Music (MSM) Pre-College, 2003-2015

Musical Honors

- Selected 3 times to perform in MPP's end-of-year concert at Carnegie Weill Hall
- Recipient of MSM Rosetta Goodkind Scholarship and Ralph Zola Scholarship; multi-time winner of MSM's concerto and chamber music competitions
- Recipient of National Young Arts Foundation Merit Award, 2013
- Featured on NPR's *From The Top* Show #253, 2012
- Winner of international piano competitions held by organizations including American Protégé, American Fine Arts Festival, and New York International Artists Association
- Summer programs: Tanglewood, Bowdoin, Beijing International Music Festival and Academy

SKILLS

- Programming languages (proficient): Java, Python, BASH
- Programming languages (familiar): C, C++, R, JavaScript, HTML/CSS
- Tools: Git, LaTeX, Amazon Mechanical Turk development, virtual machines on Google Cloud
- Languages: English, Chinese Mandarin
- Leadership skills: innovation, initiative, organization, team management, teaching
- Presentation skills: public speaking, debate (Lincoln-Douglas), music performance (classical piano, chamber music, violin, and choir)

REFERENCES

Dr. Kathleen McKeown
Henry and Gertrude Rothschild Professor of Computer Science and Founding Director of Columbia's Data Science Institute
kathy@cs.columbia.edu
Relationship: Primary Research Advisor

Dr. Julia Hirschberg
Percy K. and Vida L. W. Hudson Professor of Computer Science and Department Chair (2012-2018)
julia@cs.columbia.edu
Relationship: Mentor and Department Chair

Dr. Smaranda Muresan
Research Scientist at Columbia's Data Science Institute and Adjunct Associate Professor of Computer Science
smara@columbia.edu
Relationship: Research Advisor and Instructor

Dr. Desmond Patton
Associate Professor of the School of Social Work and Founding Director of Columbia's SAFE Lab
dp2787@columbia.edu
Relationship: Research Advisor

Last updated: June 2, 2019
https://serinachang5.github.io/assets/files/CV.pdf