

# Serina Chang

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<https://serinachang5.github.io>

## EDUCATION

**Columbia University, Columbia College**, New York, NY  
B.A., major in Computer Science, concentration in Sociology  
Cumulative GPA: 3.95/4.0

**Sep 2015-May 2019**  
**(expected)**

**Hunter College High School (HCHS)**, New York, NY  
Graduated with honors from Social Studies, Math, English, and Music depts.  
Cumulative GPA: 97.8/100.0

**Sep 2009-Jun 2015**

## RESEARCH INTERESTS

My research interests lie at the intersection of computer science and social science. Specifically, I aim to develop new methods of natural language processing (NLP) and machine learning (ML) that improve how we automatically infer social meaning and detect social phenomena from various unstructured text. My goal is to create interdisciplinary systems that push the frontiers of computer science and social science, and provide scalable and ethical solutions to widespread societal problems.

## HONORS

- **Columbia College**, Dean's List (all semesters). *Awarded to students who have earned a minimum GPA of 3.6 or higher in the term.*
- 2019** **Computing Research Association**, Outstanding Undergraduate Researcher Award. *Recognizes undergraduate students in North American colleges and universities who show outstanding research potential in an area of computing research.*
- 2018** **National Center for Women and Information Technology**, Collegiate Award Finalist. *Honors the outstanding computing accomplishments of undergraduate and graduate women.*
- 2018** **Columbia University**, King's Crown Leadership Award, Innovation and Enhancement. *Recognizes college and engineering students who have made significant contributions to the Columbia community.*
- 2018** **National Center for Women and Information Technology**, Collegiate Award Finalist.
- 2017** **Columbia Impact Solvathon, Citi Ventures Challenge**, Second Place. *Columbia Impact brings together undergraduate and graduate students across schools to address local NYC issues in healthcare, transportation, tech, and the environment. My team was awarded for our project, "FinalMile," which facilitates aid delivery to disaster-struck areas.*
- 2017** **Google**, Grace Hopper Conference (GHC) Intern Grant (Orlando, FL)
- 2017** **Capital One**, Software Engineering Summit (Arlington, VA)
- 2016** **Computing Research Association**, GHC Research Scholar (Houston, TX)
- 2015** **AP Board**, AP Scholar with Distinction
- 2014** **National Merit Board**, National Merit Finalist

## PUBLICATIONS

**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.” *Empirical Methods in Natural Language Processing* (EMNLP), Oct. 2018, Brussels, Belgium (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 Aligned Summarization Corpora.” *European Association for Computational Linguistics*, Apr. 2017, Valencia, Italy (Short Paper and Oral Presentation, 9.3% acceptance rate). <http://aclweb.org/anthology/E17-2008>.

## RESEARCH EXPERIENCE

**Undergraduate Senior Thesis (in progress)** | Advised by Prof. Kathleen McKeown, 2018-2019

Developing a dataset and novel methodology to construct a database for entity-level gender association, automatically inferred from popular media.

**Discovering Latent Social Networks of Gang-Involved Communities** | Foundations of Graphical Models (STAT 6701, Prof. David Blei), Fall 2018

Developed probabilistic ML 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 on Social Media Using Context** | Advised by Prof. Kathleen McKeown, Spring 2018

Built a Convolutional Neural Net (CNN) to automatically detect Aggression and Loss in social media posts by gang-involved youth. Designed methods to automatically construct domain-specific word embeddings, an emotion lexicon, and context features; led to significant performance improvements.

**Automating the Bechdel Test** | NLP in Context: Computational Models of Social Meaning (COMS 6998, Prof. Smaranda Muresan), Spring 2018

Automated the Bechdel test, a metric used to assess the presence of women in film. Built Support Vector Machines using features such as linguistic frames and social network metrics; performed better than the state-of-the-art (Agarwal et al., 2015) on two of the steps and comparably on the overall task.

**Crowd-Sourced Iterative Annotation for Aligned Summarization Corpora** | Advised by Prof. Kathleen McKeown, Summer & Fall 2016

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

## PRESENTATIONS

- 2018**      **Invited Speaker**, Columbia Womxn in CS Lightning Talks
- 2018**      **Oral Presentation**, Empirical Methods in Natural Language Processing (EMNLP)
- 2018**      **Invited Speaker**, NLP at Columbia
- 2018**      **Invited Speaker**, Columbia Emerging Scholars Program
- 2018**      **Panelist**, Columbia Engineering Undergraduate Research Panel
- 2017**      **Invited Speaker**, Columbia Emerging Scholars Program
- 2013**      **Featured Speaker and Musical Performer**, Hunter College Campus Schools TEDx

## WORK EXPERIENCE

**Google, Software Engineering Intern**, 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

**Google, Engineering Practicum Intern**, 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 & MENTORSHIP

**Instructor** | Girls Who Code, Summer 2019 (incoming)

**Instructional Assistant** | Data Structures in Java (COMS 3134, P. Blaer), Spring 2017, Fall 2017  
Led discussion sections, held weekly office hours, and graded assignments and exams.

**Womxn in CS Mentor** | Columbia Womxn in CS (WiCS) Coffee Chats, Fall 2018  
Participated in WiCS Coffee Chats program, which connects WiCS board members with Columbia students who are seeking advice on classes, internships, research opportunities, and more.

**Writing Coach** | HCHS 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** | HCHS 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, Sep 2017

Led my team to build a supply-chain platform that can facilitate aid to disaster-struck areas – I formulated package delivery as an AI search problem and implemented an algorithm to optimize delivery efficiency in the last mile.

**in memoriam** | Monthly Music Hackathon, Jan 2017

Initiated and 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 it into notes.

## RELEVANT COURSEWORK

*Computational:* NLP, ML, 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, Contemporary Civilization I and II, 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**

- Recipient of MSM Rosetta Goodkind Scholarship and Ralph Zola Scholarship
- Multi-time winner of MSM's concerto and chamber music competitions
- Selected 5 times for Chamber Music Society of Lincoln Center's Young Musicians Concerts in Alice Tully Hall, 2011-2015
- 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 music programs: Boston University Tanglewood Institute, Bowdoin International Music Festival, 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, team management, organization, decision-making, communication, moderating discussion, teaching, mentoring
- 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](mailto: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](mailto: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](mailto: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](mailto:dp2787@columbia.edu)

*Relationship: Research Advisor*