Serina Chang

sc3003@columbia.edu | (646) 300-1686
http://www.cs.columbia.edu/~sc3003/

EDUCATION

Columbia University, Columbia College, New York, NY — **Sep 2015-May 2019 (expected)**
B.A., major in Computer Science, concentration in Sociology
Cumulative GPA: 3.93/4.0

Hunter College High School, New York, NY — **Sep 2009-Jun 2015**
Graduated with honors from Social Studies, Math, English, and Music depts.
Cumulative GPA: 97.8/100.0

RESEARCH INTERESTS

My research interests lie at the intersection of computer science and social science. Specifically, I hope to develop new methods of natural language processing (NLP) and machine learning (ML) that improve how we infer social meaning and detect social phenomena from various unstructured text. My goal is to create interdisciplinary computational 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.*

2018 **Computing Research Association**, Outstanding Undergraduate Researcher Award (pending). *Nominated by the Columbia CS Department; recognizes undergraduate students who show outstanding potential in computing research.*

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. *Honors the outstanding computing accomplishments of undergraduate and graduate women.*

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

2013 **TEDx Hunter College Campus Schools**, Speaker and Musical Performer

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.

- Built a Convolutional Neural Net (CNN) system to automatically detect Aggression and Loss in Twitter posts by gang-involved youth; predictions could be used by local violence prevention organizations to identify gang-involved escalation and prevent violence
- Developed a novel system to automatically construct domain-specific word embeddings, an emotion lexicon, and context features; led to a significant improvement in CNN system

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.

- 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
- Designed one new task to align extractive and abstractive summaries at the phrase level and another task to annotate the phrase-to-phrase alignments for rewriting techniques (e.g. generalization, syntactic reordering); analyzed AMT results for confidence levels and interannotator agreement

ADDITIONAL RESEARCH EXPERIENCE

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

- Developing a dataset and novel methodology to automatically infer subjective knowledge about entities, beginning with entity-level gender association
- Gender associations capture real-world social constructs that shed insight on norms and how they differ across communities (e.g. mainstream, alt-right, LGBTQ); potentially also useful for tasks such as detecting abusive language that employs stereotypes and social constructs to insult targets

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

- Developing a probabilistic ML model to automatically infer relations between users in a large unlabeled corpus of Twitter posts by gang-involved youth in Chicago
- Relations may be used to better understand the social world of the youth or as context for tasks such as detecting Aggression and Loss (Chang et al., 2018)

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

- Automated the Bechdel test, a three-part metric used to assess the presence of women in film
- Built a pipeline of Support Vector Machines to predict each step of the Bechdel test 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

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

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 split requests based on traffic source on the primary monitoring console for Google Now
- Completed stretch projects that improved the functionality of company-wide monitoring tools

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.

TEACHING & MENTORSHIP

Columbia University, New York, NY

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.

Invited Speaker | Emerging Scholars Program (COMS 1014, A. Cannon), Spring 2018, Fall 2018; WiCS Lightning Talks, Fall 2018; Columbia Engineering Undergraduate Research Panel, Fall 2018. Presented my work in NLP and encouraged students to get involved in research; maintained mentoring relationships with students who reached out to me afterwards.

Hunter College High School (HCHS), New York, NY

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.

LEADERSHIP & INNOVATION

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 two-hour concerts at Lincoln Center featuring all accepted ensembles, dress rehearsals, master classes with guest artists, lightning talks with innovative thinkers in the industry, and social events for participants
- Earned financial grants from Columbia, managed fundraising, and succuessfully budgeted festival fees such that we covered all production costs but kept the festival financially accessible (participant fees for the entire weekend never exceeded $40)

ADDITIONAL INTEREST – CLASSICAL MUSIC

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

Chamber Music, Columbia Music Performance Program (MPP), Fall 2015-present (all semesters)

- Studied piano duo with Dr. Deborah Bradley-Kramer and piano trio with Dr. Muneko Otani
- Presented annual full-hour programs in MPP Mid-Day Music Series at Columbia Faculty House
- Twice selected by MPP to perform in annual concert at Carnegie Weill Hall

Musical Studies, Manhattan School of Music (MSM) Pre-College, 2003-2015

- Studied piano with Ms. Elena Belli, chamber music with Dr. Yegor Shevtsov, and violin with Ms. Christina Khimm; also took classes in Theory, Ear Training, and Orchestra
- Recipient of the Rosetta Goodkind Scholarship and Ralph Zola Scholarship
- Multi-time winner of MSM's concerto and chamber music competitions

Honors

- Selected 5 times for Chamber Music Society of Lincoln Center's Young Musicans Concert 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
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