

Koustuv Saha

Curriculum Vitae

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A computer scientist interested in the interdisciplinary area of computational social science and its applications in mental wellbeing and precision medicine, working with real-world problems from natural language processing, machine learning, causal inference analysis, and statistical modeling. Current research involves sensing mental health using social media with a focus on *situated communities* such as college campuses and workplaces.

Education

2016– **Doctor of Philosophy Student**, *Computer Science*.

School of Interactive Computing, Georgia Institute of Technology

Advisor: Dr. Munmun De Choudhury, Specialization: Social Computing

- April 2018, Passed Ph.D. Qualifying Examination. Committee: Dr. Gregory D. Abowd (Chair), Dr. Jacob Eisenstein, Dr. Thomas Ploetz, and Dr. Munmun De Choudhury (Advisor)

2008–2012 **Bachelor of Technology (Hons.)**, *Computer Science and Engineering*.

Computer Science and Engineering, Indian Institute of Technology Kharagpur

Guide: Dr. Sujoy Ghose, B.Tech Project: Ontology based Semantic Information Retrieval

Publications

Refereed Conference and Journal Articles

- 2020 Das Swain, V.*, **Saha, K.***, Reddy, M. D., Rajvanshy, H., Abowd, G. D., & De Choudhury, M. CHI (2020). Modeling Organizational Culture with Workplace Experiences Shared on Glassdoor. *To Appear In Proceedings of the CHI Conference on Human Factors in Computing Systems*, (* co-primary authors), [PDF](#).
- 2020 **Saha, K.**, Ernala, S. K., Dutta, S., Sharma, E., & De Choudhury, M. (2019). Understanding HCII Moderation in Online Mental Health Communities. *To Appear in 22nd International Conference on Human-Computer Interaction*, Springer LNCS.
- 2019 **Saha, K.**, Reddy, M.D., Mattingly, S.M., Moskal, E., Sirigiri, A., & De Choudhury, M., CSCW (2019). LibRA: On LinkedIn based Role Ambiguity and Its Relationship with Wellbeing and Job Performance. In *Proceedings of the ACM on Human-Computer Interaction (PACM HCI)*, 3, (CSCW), 137., *Presented at CSCW 2019*, [PDF](#).
- 2019 **Saha, K.**, Kim, S.C., Reddy, M.D., Carter, A.J., Sharma, E., Haimson, O.L., & De Choudhury M., (2019). The Language of LGBTQ+ Minority Stress Experiences on Social Media. In *Proceedings of the ACM on Human-Computer Interaction (PACM HCI)*, 3, (CSCW), 89., *Presented at CSCW 2019*, [PDF](#).
- 2019 **Saha, K.**, Sugar, B., Torous, J., Abrahao, B., Kiciman, E., & De Choudhury, M. (2019). ICWSM A Social Media Study on The Effects of Psychiatric Medication Use. In *Proceedings of the 13th International AAAI Conference on Web and Social Media.*, *Presented at ICWSM 2019*, [Outstanding Study Design Paper](#), [PDF](#).
- 2019 **Saha, K.**, Chandrasekharan, E., & De Choudhury, M. (2019). WebSci Effects of Hateful Speech in Online College Communities. In *Proceedings of the 11th ACM Conference on Web Science*, *Presented at WebSci 2019*, [PDF](#).

- 2019 **Saha, K.**, Reddy, M.D., Das Swain, V., Gregg, J.M., Grover, T., Lin, S., Martinez, G.J.,
ACII Mattingly, S.M., Mirjafari, S., Mulukutla, R., Nies, K., Robles-Granda, P., Sirigiri, A., Yoo,
D.W., Audia, P., Campbell, A.T., Chawla, N.V., D'Mello, S.K., Dey, A.K., Jiang, K., Liu, Q.,
Mark, G., Moskal, E., Striegel, A., & De Choudhury, M. (2019). Imputing Missing Social Media
Data Streams in Multisensor Studies of Human Behavior. In Proceedings of the 8th International
Conference on Affective Computing and Intelligent Interaction (ACII), (Non *first three* authors
are listed alphabetically), *Presented at ACII 2019*, [PDF](#).
- 2019 Das Swain, V., **Saha, K.**, Rajvanshy, H., Sirigiri, A., Gregg, J.M., Lin, S., Martinez, G.J.,
IMWUT Mattingly, S.M., Mirjafari, S., Mulukutla, R., Nies, K.A., Reddy, M.D., Robles-Granda, P.,
Campbell, A.T., Chawla, N.V., D'Mello, S.K., Dey, A. K., Jiang, K., Liu, Q., Mark, G.,
Moskal, E., Striegel, A., Tay, L., Abowd, G.D., & De Choudhury, M (2019). A Multi-Sensor
Person-Centered Approach to Understand the Role of Daily Activities in Job Performance with
Organizational Personas. In Proceedings of the ACM on Interactive, Mobile, Wearable and
Ubiquitous Technologies, 3,(4),130., (Non *first four* authors are listed alphabetically), [PDF](#).
- 2019 Morshed, M. B., **Saha, K.**, Li, R., D'Mello, S.K., De Choudhury, M., Abowd, G.D., & Ploetz,
IMWUT T., (2019). Prediction of Mood Instability with Passive Sensing. In Proceedings of the ACM on
Interactive, Mobile, Wearable and Ubiquitous Technologies, 3,(3),75., [PDF](#).
- 2019 **Saha, K.***, Torous, J.*, Ernala, S.K., Rizuto, C., Stafford, A., & De Choudhury, M. (2019). A
TBM Computational Study of Mental Health Awareness Campaigns on Social Media. Translational
Behavioral Medicine, (** co-primary authors*), [Link](#).
- 2019 **Saha, K.**, Bayraktaraglu, A.E., Campbell, A.T., Chawla, N.V., De Choudhury, M., D'Mello,
CHI Case S.K., Dey, A.K., Gao, G., Gregg, J.M., Jagannath, K., Mark, G., Martinez, G.J, Mattingly, S.M.,
Study Moskal, E., Sirigiri, A., Striegel, A., & Yoo, D. W., (2019). Social Media as a Passive Sensor
in Longitudinal Studies of Human Behavior and Wellbeing. In Proceedings of the 2019 CHI
Conference on Human Factors in Computing Systems Extended Abstracts, (Non *first* authors
are listed alphabetically), *Presented at CHI 2019*, [PDF](#).
- 2019 Mirjafari, S., Masaba, K., Grover, T., Wang, W., Audia, P., Campbell, A.T., Chawla, N.V.,
IMWUT Das Swain, V., De Choudhury, M., D'Mello, S.K., Dey, A.K., Gao, G., Gregg, J.M., Grover, T.,
Jagannath, K., Jiang, K., Lin, S., Liu, Q., Mark, G., Martinez, G.J, Mattingly, S.M., Moskal, E.,
Mulukutla, R., Nepal, S., Nies, K.A., Reddy, M.D., Robles-Granda, P., **Saha, K.**, Sirigiri, A., &
Striegel, A., (2019). Differentiating Higher and Lower Job Performers in the Workplace using
Mobile Sensing. In Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous
Technologies, 3, (2), 37, (Non *first four* authors are listed alphabetically), [PDF](#).
- 2019 Mattingly, S.M., Gregg, J.M., Audia, P., Bayraktaraglu, A.E., Campbell, A. T., Chawla, N.V,
CHI Case Das Swain, V., De Choudhury, M., D'Mello, S.K., Dey, A.K., Gao, G., Jagannath, K., Jiang,
Study K., Lin, S., Liu, Q., Mark, G., Martinez, G.J, Masaba, K., Mirjafari, S., Moskal, E., Mulukutla,
R., Nies, K., Reddy, M.D., Robles-Granda, P., **Saha, K.**, Sirigiri, A., & Striegel, A., (2019).
The Tesseract Project: Large-Scale, Longitudinal, *In Situ*, Multimodal Sensing of Information
Workers. In Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems
Extended Abstracts, (Non *first two* authors are listed alphabetically), [PDF](#).
- 2019 Ribeiro, F.N.*, **Saha, K.***, Babaei, M., Henrique, L., Messias, J., Benevenuto, F., Goga, O.,
FAT* Gummadi, K.P., & Redmiles, E.M. (2019). On Microtargeting Socially Divisive Ads: A Case
Study of Russia-Linked Ad Campaigns on Facebook. In Proceedings of the 2nd ACM Conference
on Fairness, Accountability, and Transparency (FAT*), (** co-primary authors*), *Presented at
FAT* 2019*, [PDF](#).

- 2019 **Saha, K.**, Reddy, M.D., & De Choudhury M., (2019). JobLex: A Lexico-Semantic Knowledgebase of Occupational Information Descriptors. 11th International Conference on Social Informatics (SocInfo), [PDF](#).
- 2018 **Saha, K.**, Weber, I., & De Choudhury, M. (2018). A Social Media Based Examination of the Effects of Counseling Recommendations After Student Deaths on College Campuses. In Proceedings of the 12th International AAAI Conference on Web and Social Media., *Presented at ICWSM 2018*, [PDF](#).
- 2018 **Saha, K.**, & De Choudhury, M. (2017). Modeling Stress with Social Media Around Incidents of Gun Violence on College Campuses. In Proceedings of the ACM on Human-Computer Interaction, 1, (CSCW), 92., *Presented at CSCW 2018*, [PDF](#).
- 2017 **Saha, K.**, Chan, L., de Barbaro, K., Abowd, G. D., & De Choudhury, M. (2017). Inferring Mood Instability on Social Media by Leveraging Ecological Momentary Assessments. In Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies, 1, (3), 95., *Presented at UbiComp 2017*, [PDF](#).
- 2017 **Saha, K.**, Weber, I., Birnbaum, M.L., & De Choudhury, M. (2017). Characterizing Awareness of Schizophrenia Among Facebook Users by Leveraging Facebook Advertisement Estimates. Journal of Medical Internet Research, 19(5)., *Presented at Mental Health Symposium, CHI 2017*, [Link](#).
- 2017 Sharma, E.*, **Saha, K.***, Ernala, S.K.*, Ghoshal, S.*, & De Choudhury, M. (2017). Analyzing Ideological Discourse on Social Media: A Case Study on the Abortion Discourse. In Proceedings of the 2017 International Conference of The Computational Social Science Society of the Americas (CSS), (** co-primary authors*), [PDF](#).
- [Refereed Workshop Articles and Presentations](#)
- 2020 Martinez, G. J.*, Mattingly, S. M.*, Young, J., Faust, L., Dey, A.K., Campbell, A.T., De WristSense, Choudhury, M., Mirjafari, S., Nepal, S., Robles-Granda, P., **Saha, K.**, & Striegel, A. (2019). Improved Sleep Detection Through the Fusion of Phone Agent and Wearable Data Streams. In WristSense 2020: Workshop on Sensing Systems and Applications Using Wrist Worn Smart Devices, colocated with IEEE PerCom, (** co-primary authors*).
- 2019 **Saha, K.**, Chandrasekharan, E., & De Choudhury, M. (2019). Hateful Speech in Online College Norms, Communities. In Managing and Designing for Norms in Online Communities Workshop, colocated with ICWSM 2019, [PDF](#).
- 2019 Hickman, L., **Saha, K.**, De Choudhury, M., & Tay, L. (2019). Automated Tracking of Components of Job Satisfaction via Text Mining of Twitter Data. In Machine Learning Symposium, colocated with Annual Society for Industrial and Organizational Psychology Conference (SIOP 2019), [PDF](#).
- 2019 Lin, S., Mattingly, S.M., Han, X., Audia, P., Campbell, A. T., Das Swain, V., De Choudhury, Future of M., D'Mello, S.K., Dey, A.K., Gao, G., Gregg, J.M., Jagannath, K., Jiang, K., Liu, Q., Mark, G., Work, Martinez, G.J, Masaba, K., Moskal, E., Mulukutla, R., Nies, K.A., Reddy, M.D., Robles-Granda, CHI P., **Saha, K.**, Sirigiri, A., & Striegel, A., Chawla, N.V., (2019). Sensing Personality to Predict Job Performance. In the Future of Work Workshop, colocated with ACM CHI 2019, [PDF](#).
- 2018 **Saha, K.**, Ernala, S., Rizuto, C., Torous, J., & De Choudhury, M. (2018). A Study of SMHealth, Mental Health Awareness Campaigns on Social Media. In Social Media and Health (SMHealth) ICWSM Workshop, colocated with ICWSM 2018.

- 2017 **Saha, K.**, Weber, I., Birnbaum, M.L., and De Choudhury, M. (2017). Characterizing Awareness of Schizophrenia Among Facebook Users by Leveraging Facebook Advertisement Estimates. In MH, CHI of Schizophrenia Among Facebook Users by Leveraging Facebook Advertisement Estimates. In Mental Health Symposium, colocated with CHI 2017.

Patents

- 2015 Patel, L., **Saha, K.**, Das, S., & Biswas, A., A System and Method for Sentiment Analysis of Text., *US Provisional Patent Filed, Aug'14, US Patent Filed, Aug'15.*
- 2015 Patel, L., **Saha, K.**, Das, S., & Biswas, A., A System and Method for scalable and continuous learning and annotation of data., *US Provisional Patent Filed, Mar'15.*
- 2014 Bose, A., **Saha, K.**, Das, S., & Biswas, N., A System and Method for Predicting Compliance Issues., *US Provisional Patent Filed, Feb'14.*

Experience

- Aug 2016 – **Graduate Research Assistant**, *Georgia Tech*, School of Interactive Computing.
Advised by Dr. Munmun De Choudhury, as a Ph.D. (Computer Science) student, I specialize in social computing. Broadly motivated in topics and methods related to computational social science and human-centered machine learning. In particular, my research interest involves social media sensing of mental wellbeing in situated communities, such as college campuses and workplaces.
- May 2019 – **Research Intern**, *Microsoft Research*.
- August 2019 Advised by Dr. Amit Sharma, I conducted retrospective case-control based causal study in observational setting. In particular, we investigated the question of *what* factors lead to effective psychosocial outcomes in online mental health communities. We quantified individuals' psychosocial outcomes in an online mental health community, and then compared the social support based interventions received by individuals who improved the most (*Case*) against those who improved the least (*Control*).
- May 2018 – **Visiting Scholar**, *Max Planck Institute for Software Systems (MPI-SWS)*.
- July 2018 Advised by Dr. Krishna P. Gummadi, I worked on the problem of how social media based advertising platforms enable advertisers to micro-target their audience in a malicious way. We experimentally studied how Facebook ads from the Russian IRA run prior to 2016 U.S. elections exploited Facebook's targeted advertising platform to target ads on divisive or polarizing topics (eg, immigration, race-based policing) at vulnerable sub-populations.
- May 2017 – **Research Intern**, *Fred Hutch*, Hutch Data Commonwealth.
- July 2017 Advised by Dr. Naveen Ashish, I worked in the domain of biomedical data sciences and computational social science. My primary research problem included high dimensional machine learning using genomics data to predict the risk of Colorectal Cancer. Also, worked on quantifying the 'impact' of tweets to analyze the outreach of Cancer Research information and awareness.
- Dec 2012 – **Senior Researcher**, *Abzooba Inc.*, X, NLP & Data Sciences R&D.
- Aug 2016 As the product development lead of XPresso, Abzooba's flagship product, improvised techniques, and implemented modules for extracting information in an end-to-end automated, scalable, and efficient fashion. Worked with predictive analytics based business problems from finance, retail, and healthcare sector. Instrumental in conceptualization and implementation of Continuous Learning System (CLS). Ranked 1st at a US based retail giant's Hackathon for Compliance Risk Index (CRIX). Role involved dealing with algorithms and techniques in NLP and Machine Learning, as well as technological advances in software development at production level.
- NLP problems such as aspect based sentiment analysis, emotion categorization, document classification, semantic search, trending topics detection, ontology building, and so on.
 - NLP techniques like Semantic Role Labeling, Dependency Parsing, Word-Vectors, Topic Modeling, Latent Semantic Hashing.
 - Data Sciences problems like predicting compliance risk, member expenses, distributor costs, etc.

- Sep 2013 – **Visiting Faculty Member**, *Praxis Business School*, Analytics.
- Jul 2014 Conducted courses on Big Data Analytics and Retail Analytics. Subjects included Hadoop, Map Reduce, Unix and Programming fundamentals, and Natural Language Processing.
- Aug 2012 – **Junior Research Associate**, *Infosys Ltd.*, Infosys Labs, R&D.
- Nov 2012 Conceptualized & implemented an information extraction tool from unstructured financial reports. Contributed in ideation of a semantic similarity based recommendation system of research projects.
- May 2011 – **Research Intern**, *Siemens Information Systems Ltd.*, Corporate Technologies R&D.
- July 2011 Set up a Hadoop cluster of 30 computers, installed Mahout and Katta for running jobs. Developed a tool for accessing Lucene indexes to search and analyze their content based on parameters.

Academic Distinctions

- 2008 Qualified in Top 0.5% at IITJEE 2008 and Top 0.3% at AIEEE 2008.
- 2006 Awarded National Talent Search Examination (NTSE) Scholarship by NCERT, Govt. of India.

Miscellaneous

- Skills and Interest Computational Social Science, Crisis Informatics, Social Computing, Mental Health, Campus Wellbeing, Workplace Wellbeing, Natural Language, Causal Inference, Time Series, Statistical Modeling, Machine Learning, Data Sciences
- Reviewing (Journals) JMIR, IEEE TAFF, PLOS One, ACM TOCHI, JOPR, Nature Scientific Reports, ACM TSC, ACM TWEB
- Reviewing (Conferences) ACM CSCW (2017, 2018, 2019), ACM CHI (2017, 2018, 2019, 2020), WebConf (2019, 2020), AAAI ICWSM (2019, 2020), ACII (2019)
- PC Member WebConf (2020), AAAI ICWSM (2019, 2020), ACM WebSci (2020), ASONAM (2019), EMNLP W-NUT Workshop (2019), ACII ML for Mental Health Workshop (2019)
- Org. Comm. Web Chair (AAAI ICWSM 2020)
- Programming Java, Python, R, C, Bash, HTML, CSS, Javascript
- Libraries Stanford CoreNLP, LIWC, NLTK, WordNet, Pandas, Scikit-Learn, Vowpal Wabbit
- Framework MySQL, MongoDB, BigQuery, Hadoop, Neo4J
- Languages English, Bengali, Hindi