Sharath Chandra Guntuku

Computer and Information Science, University of Pennsylvania
3400 Walnut St, Philadelphia, PA 19104

sharathg@sas.upenn.edu • https://chandrasg.github.io/
LinkedIn • Github

Education

Nanyang Technological University (NTU) — **Singapore**
Ph.D., Computer Science, GPA – 4.7/5.0 — *2013 - 2017*
Advisor: Lin Weisi, PhD
Thesis: Modeling User Factors in Multimedia Preferences

Birla Institute of Technology & Science (BITS) - Pilani — **India**
B.E. (Hons), Computer Science, GPA – 8.99/10.0 — *2009 - 2013*
Advisor: Chittaranjan Hota, PhD
Thesis: Detecting Security Threats in P2P Networks using Machine Learning

Professional Appointments

Assistant Professor (Research) — **University of Pennsylvania, U.S.A**
Computer and Information Science — *May 2020 – now*

Senior Fellow
Leonard Davis Institute of Health Economics — *June 2020 – now*

Research Scientist
Penn Medicine Center for Digital Health — *Sep 2018 – now*

Postdoctoral Researcher
Penn Medicine Center for Digital Health — *Apr 2017 – Aug 2018*

Visiting Scholar
World Well-Being Project — *Aug 2016 – Mar 2017*

Research Intern — **Panasonic R&D, Singapore**
Deep Learning for 3D Face Recognition — *Jan – Jun 2016*

Grants & Fellowships

NIH NHLBI
(Key Personnel, $3,500,000), PI: Raina Merchant — *2018-2022*

Pennsylvania State COVID Response
(Key Personnel), PI: Kevin Volpp — *2020-2021*

NIH NIMH
(Key Personnel), PI: Ian Barnett — *2019-2022*

Penn China Research and Engagement Fund
(Co-Investigator, $100,000), PI: Lyle Ungar — *2020-2021*

Once Upon A Time Foundation
(Lead Computer Scientist, $1,000,000), PI: Raina Merchant *2018-2020*

NVIDIA GPU Grant
(Titan XP) *2018*

Nanyang Technological University Graduate Research Scholarship
($88,100) *2013-2017*

Nanyang Engineering Doctoral Fellowship
($4,410) *2013-2014*

Research Interests and Technical Skills

- **Research Interests:** Digital Phenotyping, Mental Health, Natural Language Processing, Multimedia Computing, Machine Learning
- **Technical Interests:** Building frameworks that support data collection, processing, and hypothesis testing from multi-modal data (Text, Images, and Sensors) using Python and R

Publications

[**Google Scholar**] Current citations: 863; i10-index: 24; h-index: 15

Book Chapters

1. Interactive Data Visualization with Python: Present your data as an effective and compelling story, Packt Publishing, ISBN-13: 978-1838648350 ISBN-10: 1838648, 2019 [Link]

Refereed Journal Articles

25. **Guntuku S.C.**, Sherman G., Stokes D.C., Agarwal A., Seltzer E., Merchant R.M, Ungar L.H. Tracking mental health and symptom mentions on Twitter during COVID-19 , 2020 Journal of general internal medicine, 2020

24. **Guntuku S.C.**, Schwartz H.A., Gaulton J., Stokes D.C., Asch D.A, Kashyap A., Ungar L.H., Merchant R.M *"Variability in Language used on Social Media prior to Hospital Visits"*, Nature Scientific Reports, 2020

23. **Guntuku S.C.**, Gaulton J., Seltzer E., Asch D., Srinivas S., Ungar L., Klinger E., Merchant R., *"Social media posts predict pregnancy status, trimester, and parity"*, Women's Health, 2020

22. Simchon A., **Guntuku S.C.**, Simhon R., Ungar L.H, Giliad M., *"Political Depression? A Big-Data, Multi-Method Investigation of Americans' Emotional Response to the Trump Presidency"*, Journal of Experimental Psychology: General, 2020,

21. Stokes, D.C., Andy, A., **Guntuku, S.C.**, Ungar, L.H. and Merchant, R.M., 2020. *"Public priorities and concerns regarding covid-19 in an online discussion forum: Longitudinal topic modeling"*. Journal of general internal medicine, p.1.

20. **Guntuku, S. C.**, Agarwal, S., Robinson, O., Dunn, A., & Ungar, L. (2020). *"Examining the Phenomenon of Quarter-life Crisis through Artificial Intelligence and the Language of Twitter"*. Frontiers in Psychology, 11, 341. (first and second authors have equal contribution)

19. **Guntuku S.C.**, Schneider R.C, Pelullo A., Young J.F, Wong V., Ungar L.H, Polsky D., Volpp K., & Merchant R.M. *"Characterizing and Measuring Expressions of Loneliness in Individuals using Twitter"* BMJ Open, 2019

18. Seltzer E., Goldshear J., **Guntuku S.C.***, Grande D., Asch D., Klinger E.V., Merchant R.M, (2019, in press) *"Patients' willingness to share digital health and non-health data for research"* BMC Medical Informatics and Decision Making (* – corresponding author)

17. Merchant, R. M., Asch, D. A., Crutchley, P., Ungar, L. H., **Guntuku, S. C.**, Eichstaedt, J. C., Hill, S., Padrez, K., Smith, R. J., & Schwartz, H. A. (2019, in press). *"Evaluating the Predictability of Medical Conditions from Social Media Posts*. PLoS One.

16. Agarwal A.K., Wong V., Pelullo A., **Guntuku S.C.**, Polsky D., Asch D.A., Muruako J., & Merchant R.M., *"Online Reviews of Specialized Drug Treatment Facilities – Identifying potential drivers of high and low patient satisfaction"*. Journal of General Internal Medicine. 2019

15. Yang, Q., Tufts, C., Ungar, L., **Guntuku, S.C.**, & Merchant, R. (2018). *"To retweet or not to retweet: Understanding what features of cardiovascular tweets influence their retransmission*. Journal of health communication, 23(12), 1026-1035.

14. Samani, Z. R., **Guntuku, S. C.**, Moghaddam, M. E., Preoţiuc-Pietro, D., & Ungar, L. H. (2018). *"Cross-platform and cross-interaction study of user personality based on images on Twitter and Flickr*. PloS one, 13(7), e0198660. [Link] (* - corresponding author)

13. Jakhetiya, V., Gu, K., Singhal, T., **Guntuku, S. C.**, Xia, Z., & Lin, W. (2018). *"A Highly Efficient Blind Image Quality Assessment Metric of 3D-Synthesized Images using Outlier Detection*. IEEE Transactions on Industrial Informatics.

12. Zhu, Y., **Guntuku, S. C.**, Lin, W., Ghinea, G., & Redi, J. A. (2018). *"Measuring Individual Video QoE: A Survey, and Proposal for Future Directions Using Social Media*. ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM), 14(2s), 30. [PDF]

11. Jakhetiya, V., Lin, W., Jaiswal, S., Gu, K., & **Guntuku, S. C.** (2018). *"Just Noticeable Difference for natural images using RMS contrast and feed-back mechanism"*. Neurocomputing, 275, 366-376. [PDF]

10. **Guntuku, S. C.**, Ramsay, J. R., Merchant, R. M., & Ungar, L. H. (2017). *"Language of ADHD in adults on social media"*. Journal of attention disorders, 1087054717738083. [PDF]

9. **Guntuku, S. C.**, Yaden, D. B., Kern, M. L., Ungar, L. H., & Eichstaedt, J. C. (2017). *"Detecting depression and mental illness on social media: an integrative review"*. Current Opinion in Behavioral Sciences, 18, 43-49. [PDF]

8. Jakhetiya, V., Lin, W., Jaiswal, S. P., **Guntuku, S. C.**, & Au, O. C. (2017). *"Maximum a posterior and perceptually motivated reconstruction algorithm: A generic framework"*. IEEE Transactions on Multimedia, 19(1), 93-106. [PDF]

7. Prakhya, S. M., Liu, B., Lin, W., Jakhetiya, V., & **Guntuku, S. C.** (2017). *"B-SHOT: a binary 3D feature descriptor for fast Keypoint matching on 3D point clouds"*. Autonomous Robots, 41(7), 1501-1520.

6. **Guntuku, S. C.**, Zhou, J. T., Roy, S., Lin, W., & Tsang, I. W. (2016). *"Understanding deep representations learned in modeling users likes"*. IEEE Transactions on Image Processing, 25(8), 3762-3774. [PDF]

5. **Guntuku, S.C.**, Zhou, J., Roy, S., Lin, W., & Tsang, W. (2016). *"Who likes What, and Why? Insights into Personality Modeling based on Image Likes"*. IEEE Transactions on Affective Computing. [PDF]

4. **Guntuku, S. C.**, Scott, M. J., Lin, W., & Ghinea, G. (2016). *"Do personality and culture influence perceived video quality and enjoyment?"*. IEEE Transactions on Multimedia, 18(9), 1796-1807. (first and second author have equal contribution) [PDF]

3. **Guntuku, S. C.**, Singh, K.*, Thakur, A., & Hota, C. (2014). *"Big data analytics framework for peer-to-peer botnet detection using random forests"*. Information Sciences, 278, 488-497. (first and second author have equal contribution) [PDF]

2. Desu, R. K., **Guntuku, S. C.**, Aditya, B., & Gupta, A. K. (2014). *"Support vector regression based flow stress prediction in austenitic stainless steel 304"*. Procedia materials science, 6, 368-375. [PDF]

1. Gupta, A. K., **Guntuku, S. C.**, Desu, R. K., & Balu, A. (2015). *"Optimisation of turning parameters by integrating genetic algorithm with support vector regression and artificial neural networks"*. The International Journal of Advanced Manufacturing Technology, 77(1-4), 331-339. [PDF]

Refereed Conferences (typical acceptance rates: 15-30%)

23. Li, M., Hickman, L., Tay, L., Ungar, L. H., & **Guntuku, S. C.** *"Studying Politeness across Cultures using English Twitter and Mandarin Weibo"* (2020). ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW).

22. **Guntuku, S. C.**, Buffone, A., Jaidka, K., Eichstaedt, J.C., & Ungar, L. (2019). *"Understanding and Measuring Psychological Stress using Social Media"*. In AAAI Conference on Web and Social Media (ICWSM). (Acceptance rate: 17%)

21. **Guntuku, S. C.**, Preoţiuc-Pietro, D., Eichstaedt, J. C. & Ungar, L. H. (2019). *"What Twitter Profile and Posted Images Reveal about Depression and Anxiety"*. In AAAI Conference on Web and Social Media (ICWSM). (Acceptance rate: 17%)

20. **Guntuku, S. C.**, Li, M., Tay, L. & Ungar, L. H. (2019). *"Studying Cultural Differences in Emoji Usage across the East and the West"*. In AAAI Conference on Web and Social Media (ICWSM). (Acceptance rate: 17%)

19. Liu, T., Nicholas, J., Theilig, M., **Guntuku, S.C.**, Kording, K., Mohr, D.C., Ungar, L. (2019) "Machine Learning for Phone-Based Relationship Estimation: The Need to Consider Population Heterogeneity". Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies

18. Li, M., **Guntuku, S. C.**, Jakhetiya, V. & Ungar, L. H. *"Exploring (Dis-)Similarities in Emoji-Emotion Association on Twitter and Weibo"*, 2019, EMOJI2019 colocated with The WebConf

17. Matero, M., Idnani, A., Son, Y., Giorgi, S., Vu, H., Zamani, M., Limbachiya, P., **Guntuku, S.C.** and Schwartz, H.A., 2019, June. "Suicide risk assessment with multi-level dual-context language and bert". In Proceedings of the Sixth Workshop on Computational Linguistics and Clinical Psychology (pp. 39-44).

16. Jaiswal, S.P, Jakhetiya, V., Gu, K., **Guntuku, S.C**, Singla, A., "Frequency-Domain Analysis Based Exploitation Of Color Channels For Color Image Demosaicking". 2019 IEEE Visual Communications and Image Processing (VCIP)

15. **Guntuku, S. C.**, Giorgi, S., & Ungar, L. (2018, June). *"Current and Future Psychological Health Prediction using Language and Socio-Demographics of Children for the CLPysch 2018 Shared Task"*. In Proceedings of the Fifth Workshop on Computational Linguistics and Clinical Psychology: From Keyboard to Clinic (pp. 98-106). [PDF]

14. Jaidka, K., **Guntuku, S. C.**, & Ungar, L. H. (2018, June). *"Facebook versus Twitter: Differences in Self-Disclosure and Trait Prediction"*. In Twelfth International AAAI Conference on Web and Social Media. [PDF] (Acceptance rate: 16%)

13. **Guntuku, S. C.**, Lin, W., Carpenter, J., Ng, W. K., Ungar, L. H., & Preoţiuc-Pietro, D. (2017, June). *"Studying personality through the content of posted and liked images on Twitter"*. In Proceedings of the 2017 ACM on web science conference (pp. 223-227). ACM. [PDF] (Acceptance rate: 25%)

12. Preoţiuc-Pietro, D., **Guntuku, S. C.**, & Ungar, L. (2017, September). *"Controlling human perception of basic user traits"*. In Proceedings of the 2017 conference on empirical methods in natural language processing (pp. 2335-2341). [PDF] (Acceptance rate: 25%)

11. Roy, S., & **Guntuku, S. C.** (2016, September). *"Latent factor representations for cold-start video recommendation"*. In Proceedings of the 10th ACM Conference on Recommender Systems (pp. 99-106). ACM. [PDF] (Acceptance rate: 18%)

10. **Guntuku, S. C.**, Roy, S., Lin, W., Ng, K., Keong, N. W., & Jakhetiya, V. (2016, June). *"Personalizing User Interfaces for improving quality of experience in VoD recommender systems"*. In 2016 Eighth International Conference on Quality of Multimedia Experience (QoMEX) (pp. 1-6). IEEE. [PDF]

9. **Guntuku, S. C.**, Qiu, L., Roy, S., Lin, W., & Jakhetiya, V. (2015, October). *"Do others perceive you as you want them to? Modeling personality based on selfies"*. In Proceedings of the 1st international workshop on affect & sentiment in multimedia (pp. 21-26). ACM. [PDF]

8. Scott, M. J.*, **Guntuku, S. C.***, Huan, Y., Lin, W., & Ghinea, G. (2015, October). *"Modelling human factors in perceptual multimedia quality: On the role of personality and culture"*. In Proceedings of the 23rd ACM international conference on Multimedia (pp. 481-490). ACM. (* – denotes equal contribution) [PDF] (Acceptance rate: 22%)

7. **Guntuku, S. C.**, Lin, W., Scott, M. J., & Ghinea, G. (2015, September). *"Modelling the influence of personality and culture on affect and enjoyment in multimedia"*. In 2015 International Conference on Affective Computing and Intelligent Interaction (ACII) (pp. 236-242). IEEE. [PDF] (Acceptance Rate: 28%)

6. Jakhetiya, V., Lin, W., Jaiswal, S. P., Tiwari, A. K., & **Guntuku, S. C.** (2015, July). *"Observation model based perceptually motivated bilateral filter for image reconstruction"*. In 2015 IEEE International Conference on Digital Signal Processing (DSP) (pp. 201-205). IEEE.

5. **Guntuku, S. C.**, Roy, S., & Weisi, L. (2015, June). *"Evaluating visual and textual features for predicting user likes"*. In 2015 IEEE International Conference on Multimedia and Expo (ICME) (pp. 1-6). IEEE. [PDF] (Acceptance rate: 30%)

4. **Guntuku, S. C.**, Scott, M. J., Yang, H., Ghinea, G., & Lin, W. (2015, May). *"The CP-QAE-I: A video dataset for exploring the effect of personality and culture on perceived quality and affect in multimedia"*. In 2015 Seventh International Workshop on Quality of Multimedia Experience (QoMEX) (pp. 1-7). IEEE. [PDF]

3. **Guntuku, S. C.**, Roy, S., & Weisi, L. (2015, January). *"Personality modeling based image recommendation"*. In International Conference on Multimedia Modeling (pp. 171-182). Springer, Cham. [PDF] (Acceptance Rate: 36%)

2. **Guntuku, S. C.**, Zhou, J. T., Roy, S., Weisi, L., & Tsang, I. W. (2014, November). *"Deep representations to model user likes"*. In Asian Conference on Computer Vision (pp. 3-18). Springer, Cham. [PDF] (Acceptance Rate: 3.9% Oral)

1. **Guntuku, S. C.**, Narang, P., & Hota, C. (2013). *"Real-time peer-to-peer botnet detection framework based on bayesian regularized neural network*". IEEE P2P, 2013 (Short Paper) [PDF]

Manuscripts under Review

3. **Guntuku S.C.**, Klinger E., Ungar L., Asch D., Merchant R., *"Social media usage by healthcare super-utilizers reveals potential opportunity for online social support"*

2. Seltzer E., Lanza A., **Guntuku S.C.**, Tufts C., Srinivas S., Klinger E., Asch D., Fausti N., Ungar L., Merchant R., *"Patient Experience and Satisfaction in Online Reviews of Obstetric Care"*

1. Southwick L., Merchant R., **Guntuku S.C.**, *"Social Media: A Vital Sign for Understanding Behaviors around Death?"*

Manuscripts under Preparation

5. **Guntuku S.C.**, Schneider R., Andy A., Merchant R., *"Effects of Loneliness on Hospital Utilization"*

4. **Guntuku S.C.**, Jaidka K., Liu T., Ungar L.H., Merchant R., *"Effects of Depression Diagnosis and Medication on Social Media Activity"*

3. **Guntuku S.C.**, Fan A., Talhelm T., Giorgi S., Ungar L.H. *"Studying Cultural Differences using Social Media"*

2. **Guntuku, S.C.**, Schwartz, H.A., Yaden, D., Ungar, L. H., Seligman, M. E. P., Eichstaedt, J. C. *"Linguistic markers associated with Cognitive Model of Depression on Facebook"*.

1. Southwick L.S., Klinger E., Seltzer E.S., **Guntuku S.C.**, Merchant R.M., *"Misinformation and racial threats on Titktok in the wake of Coronavirus"*.

Talks and Presentations

- **Panel Chair: Promise, challenges, and risks of digital data in mental health research and care**, American Medical Informatics Association Annual Symposium, Washington DC, 2019
- **User Generated Content: Opportunities for Health Care**, Langone School of Medicine, New York University, 2019
- **Session Chair: Using Digital Data to Measure and Understand Mental Health and Well-Being**, American Psychological Association Technology, Mind and Society Conference (APA Tech), Washington DC, 2019
- **Using Social Media to Inform Healthcare**, Informatics Day, Institute of Biomedical Informatics, UPenn, May, 2019
- **Studying Cultural Differences using Language**, Behavioral Insights from Text Conference, Wharton School, January, 2019
- **Leveraging Social and Electronic Communications in Evaluation and Treatment**, Technology in Psychiatry Summit (McLean and Harvard Med. School), Boston, November, 2018
- **Session Chair: Using Social Media to measure Psychological Health and Illness: From Individuals to Communities** American Psychological Association Technology, Mind and Society Conference (APA Tech), Washington DC, April, 2018
- **Assessing ADHD from Tweets**, Society for Personality and Social Psychology (SPSP), Atlanta GA, March, 2018
- **Studying Personality through the Content of Posted and Liked Images on Twitter**, ACM Web Science, Troy NY, June, 2017
- **Studying Personality through Selfies**, University of Pennsylvania, Philadelphia PA, 2016
- **Modelling Human Factors in Perceptual Multimedia Quality: On The Role of Personality and Culture**, ACM Multimedia, Brisbane Australia, Oct, 2015
- **Deep Representations to Model User 'Likes'**, University Cultural Center, National University of Singapore, 2014.
- **Putting a Satellite in Moon's Orbit: Present and Future Propulsion Systems**, Aeronautical Society of India, 2007.
- **Aryabhatta to Chandrayaan - India's Space Journey**, Defence Research and Development Laboratory, 2006.

Awards

- **Intel Invent50**, Finalist team (among 150 submissions) Personalized tourist hotspot recommender system, 2015
- **ACM Travel Grant**, to present at ACM Multimedia, Brisbane 2015
- **Nominated for Microsoft Research Asia Fellowship**, 1 student in the department, Nanyang Technological University, Singapore, 2015
- **Merit Scholarship**, Defence Research and Development Organization, India, 2010 & 2011
- **All India Rank** 3 **in National Cyber Olympiad**, India, 2007
- **Merit Certification for 100% score in IT**, Central Board of Secondary Education, India, 2007
- Rank 1 **in State and** 7 **in India for Aerospace Olympiad**, Aeronautical Society of India, 2007

Service to Profession

Reviewer for
- Nature Communications
- JAMA Network Open
- IEEE Transactions on Affective Computing
- IEEE Transactions on Image Processing
- IEEE Transactions on Multimedia
- EPJ Data Science
- ACM Conference on Computer Supported Cooperative Work
- AAAI Conference on Web and Social Media (ICWSM)
- American Medical Informatics Association Annual Symposium
- APA Technology, Mind & Society
- AMIA Applied Clinical Informatics
- International Conference on Acoustics, Speech, and Signal Processing
- International Conference on Image Processing
- PLoS One
- The Social Science Journal
- International Journal of Environmental Research and Public Health
- IEEE Transactions on Medical Imaging
- Journal of Clinical Medicine
- Society for Personality and Social Psychology Annual Symposium

University Service

- Member of Search Committee for Postdoctoral Fellows in Psychology, University of Pennsylvania, 2016, 2017, 2019
- Member of Search Committee for Data Scientist in Digital Health, University of Pennsylvania, 2016, 2017, 2018, 2019

Media Coverage

- **The Atlantic:** What Your Facebook Posts Say About Your Mental Health [Link]
- **The Times of India:** Twitter posts can reveal how lonely you are, says study [Link]
- **The Inquirer:** Twitter photos may help detect users with depression, anxiety [Link]
- **Penn Today** Cross-cultural similarities and differences in emoji usage [Link]
- **KYW Radio:** Social media pictures can show a lot more about your health than expected [Link]
- **Tech Times:** Twitter Users With Depression And Anxiety Tend To Post Grayscale And Low-Aesthetic Images [Link]
- **NBC News**: Mood-forecasting tech could help stop bad moods even before they strike [Link]
- **American Psychological Association**, Speaking of Psychology: Twitter and ADHD. [Link]
- **Canadian Broadcasting Corporation**: Data collection by #Facebook and other companies on OnTheMoneyCBC. [Link]
- **Mashable**: Psychographic profiling of your likes and dislikes isn't new, and it's not going away [Link]
- **Psychiatric Times**: What Twitter and Brain Imaging Reveal About ADHD. [Link]

- **Faster than Normal (#1 ADHD podcast on iTunes)**: ADHD Twitter Scientist. [Link]
- **Danish Politiken**: Technology and social media can be used to detect people with depression [Link]
- **The Conversation**: Social media can be bad for youth mental health, but there are ways it can help. [Link]
- **US News**: Can Social Media Help Improve ADHD Treatments? [Link]
- **Penn Current**: Tweets reveal emotions, behavior patterns of people who suffer from ADHD [Link]

Professional Affiliations

- Association for the Advancement of Artificial Intelligence
- Society for Social and Personality Psychology
- Association for Computing Machinery
- Institute of Electrical and Electronics Engineers

Teaching Assistance

- CE1005 Digital Logic, NTU Singapore
- CE9001 Java and Internet, NTU Singapore

Advising and Mentoring

- Mingyang Li, M.S. Data Science (Thesis), UPenn –> Google
- Shantenu Agarwal, M.S. Bioengineering (Thesis), UPenn –> Soul Machines
- Agrima Seth, M.S. Computer Science (Thesis), UPenn –> Morgan Stanley
- Xiang Cui, M.S. Computer Science, UPenn
- Zeshen, M.S. Computer Science, UPenn
- He Chen, B.S. Computer Science, UPenn –> Amazon Robotics
- Swathi Rajanna, M.S. Computer Science, UPenn –> Microsoft
- Yogitha Chilukuri, M.S. Computer Science, UPenn –> Adobe
- Angel Fan, B.S. Computer Science, UPenn
- Qingrong Ji, B.S. Computer Science, UPenn
- Harish Tata, B.E. Computer Science, GITAM –> M.S. UMKC