

# Mashfiqui Rabbi

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## Research Interest

*Areas:* Mobile health, Personalization, Adaptive Intervention

I have a keen interest in building systems that have societal impact and at the same time require solving significant computational challenges. As part of my thesis research, I have been building scalable mobile health systems that continuously capture and reason about people's physical activity, eating behaviors, sleep and social interactions. Based on such information, I am using decision theoretic techniques, applied for the first time in mobile health, to generate personalized suggestion for behavior change that can help individuals reach their well-being goals.

## Education

2016-Present	<b>Post-doctoral fellow</b> at Statistics Department, <i>University of Michigan, Ann Arbor</i> <u><i>Advisors:</i></u> Susan Murphy, Ambuj Tewari, Predrag Klasnja
2011-2016	<b>Ph.D.</b> in Information Science, <i>Cornell University</i> <u><i>Committee:</i></u> Tanzeem Choudhury (chair), Deborah Estrin, Dan Cosley Awarded Masters degree on October 2014 Graduated April 2016
2009-2011	<b>Ph.D. Student</b> in Computer Science, <i>Dartmouth College</i> <u><i>Advisor:</i></u> Tanzeem Choudhury Transferred to Cornell University with advisor and continued PhD
2003-2007	<b>B.Sc.</b> in Computer Science and Engineering, <i>Bangladesh Uni. of Eng. and Tech.</i> <u><i>CGPA:</i></u> 3.74 out of 4.00, <u><i>Major:</i></u> 3.81 <u><i>Advisor:</i></u> Saidur Rahman <u><i>Thesis Topic:</i></u> Layered drawing of planar graphs

## Work Experience

2011-2016 | **Research Assistant** in Department of Information Science at *Cornell University*

	<p><i>Notable projects:</i> <i>MyBehavior</i>, an automated and personalized health feedback system; <i>StreeSense</i>, detection of stressful interactions from face-to-face conversations; <i>SAINT</i>, a mobile sensing and inference toolkit that can handle multiple applications and can easily scale to activity recognition problems with complex inter-dependencies. <i>MoodRhythm</i>, sensing and inferring manic and depressive episodes for patients with bi-polar depression.</p>
2014	<p><b>Summer Intern</b> at <i>Intel Labs</i>  <i>Advisors:</i> Lama Nachman, Hong Lu  <i>Summary:</i> I built a mobile phone based automated personalized health feedback system where a notification is posted to a user on their watch. The notification is posted when an appropriate context of following a health suggestion arise (e.g., walking suggestions while somebody comes to office). The goal is that if a user follows the suggestion in a given context again and again then the users will build up good habits in the environment they live in.</p>
2013	<p><b>Teaching Assistant</b> in Department of Information Science at <i>Cornell University</i>  <i>Responsibility:</i> I helped setup and support a course on ubiquitous computing offered for the first time at Cornell University. Significant portion of the class involved hands on exercise in physical activity, localization, emotion and brain activity recognition.</p>
2012	<p><b>Summer Intern</b> at <i>AT&amp;T Labs Research</i>  <i>Advisors:</i> Emiliano Miluzzo, Suhrid Balakrishnan  <i>Summary:</i> I worked on a mobile phone based personalized health feedback system that applies sequential decision theory concept in health feedback for the first time. This project was showcased at the yearly “AT&amp;T Innovation Showcase ‘Connecting Your World’” in 2013. Only six projects from AT&amp;T research labs were shown at the event.</p>
2009-2011	<p><b>Research Assistant</b> in Department of Computer Science, <i>Dartmouth College</i>  <i>Notable projects:</i> <i>BeWell</i>, a persuasive system for multi-dimensional well-being (socialization, physical activity, sleep); Passive and in-situ assessment of mental (depression, sociability) and physical well-being for older adults; <i>NeuroPhone</i>, a mobile phone system to detect brain activity (P-300, blink) from off-the-shelf electroencephalography (EEG) headsets.</p>
2010	<p><b>Teaching Assistant</b> in Department of Computer Science at <i>Dartmouth College</i>  <i>Responsibility:</i> I TAed this introductory course for computer science students. I helped set up assignments and gave lectures on a few classes.</p>
2008-2009	<p><b>Quantitative Software Developer</b> in <i>Stochastic Logic Ltd., Dhaka, Bangladesh</i>  <i>Advisor:</i> Arif Dowla, Ph.D. in Mathematics, UCSD  <i>Responsibility:</i> Analysis, learning, and visualization of large financial time series data to aid decision making. I worked on projects that were outsourced to traders at Wall-street.</p>

## Publications

### *Peer reviewed Journals, Conference papers, and Book chapters*

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| 2016 | <p>M. Rabbi, M. H. Aung, and T. Choudhury. Towards health recommendation systems: An approach for providing automated personalized health feedback from mobile data. In J. Rehg, S. A. Murphy, and S. Kumar, editors, <i>Mobile Health: Sensors, Analytic Methods, and Applications</i>. Springer, 2016. to appear</p> <p>E. K. Choe, S. Abdullah, M. Rabbi, E. Thomaz, D. A. Epstein, M. Kay, F. Cordeiro, G. D. Abowd, T. Choudhury, J. Fogarty, et al. Semi-automated tracking: A balanced approach for self-monitoring applications</p> <p>M. Aung, F. Alquaddoomi, C.-K. Hsieh, M. Rabbi, L. Yang, J. Pollak, D. Estrin, and T. Choudhury. Leveraging multi-modal sensing for mobile health: a case review in chronic pain. 2016</p> |
| 2015 | <p>M. Rabbi, M. H. Aung, M. Zhang, and T. Choudhury. Mybehavior: Automatic personalized health feedback from user behavior and preference using smartphones. In <i>Ubicomp</i>, 2015</p> <p>M. Rabbi, J. Costa, F. Okeke, M. Schachere, M. Zhang, and T. Choudhury. An intelligent crowd-worker selection approach for reliable content labeling of food images. In <i>Wireless Health</i>, 2015</p> <p>M. Rabbi, A. Pfammatter, M. Zhang, B. Spring, and T. Choudhury. Automated personalized feedback for physical activity and dietary behavior change with mobile phones: A randomized controlled trial on adults. <i>JMIR mHealth and uHealth</i>, 3(2):e42, May 2015</p>  |
| 2014 | <p>P. Adams, M. Rabbi, T. Rahmant, M. Matthews, A. Volda, G. Gay, T. Choudhury, and S. Volda. Towards personal stress informatics: Comparing minimally invasive techniques for measuring daily stress in the wild. In <i>Pervasive Health</i>, 2014</p> <p>N. D. Lane, M. Lin, M. Rabbi, X. Yang, H. Lu, G. Cardone, S. Ali, A. Doryab, E. Berke, A. T. Campbell, et al. Bewell: Sensing sleep, physical activities and social interactions to promote wellbeing. <i>Mobile Networks and Applications</i>, pages 1–15, 2014</p>   |
| 2012 | <p>H. Lu, M. Rabbi, D. Frauendorfer, M. S. Mast, G. T. Chittaranjan, A. T. Campbell, D. Gatica-Perez, and T. Choudhury. Stresssense: Detecting stress in unconstrained acoustic environments using smartphones. In <i>Proceedings of the 2012 ACM Conference on Ubiquitous Computing</i>, pages 351–360. ACM, 2012</p> <p>M. Lin, N. D. Lane, M. Rabbi, X. Yang, H. Lu, G. Cardone, S. Ali, A. Doryab, E. Berke, A. T. Campbell, et al. Bewell+: multi-dimensional wellbeing monitoring with community-guided user feedback and energy optimization. In <i>Proceedings of the conference on Wireless Health</i>, page 10. ACM, 2012</p>   |

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| 2011 | <p>M. Rabbi, S. Ali, T. Choudhury, and E. Berke. Passive and in-situ assessment of mental and physical well-being using mobile sensors. In <i>Proc. 13th ACM Intl Conf. Ubiquitous Computing</i>, pages 385–394, 2011</p> <p>N. D. Lane, M. Rabbi, M. Lin, X. Yang, H. Lu, S. Ali, A. Doryab, E. Berke, T. Choudhury, and A. T. Campbell. Bewell: A smartphone application to monitor, model and promote wellbeing. In <i>5th International Conference on Pervasive Computing Technologies for Healthcare (PervasiveHealth2011)</i>, 2011</p> <p>E. M. Berke, T. Choudhury, S. Ali, and M. Rabbi. Objective measurement of sociability and activity: mobile sensing in the community. <i>The Annals of Family Medicine</i>, 9(4):344–350, 2011</p> |
| 2010 | <p>A. Campbell, T. Choudhury, S. Hu, H. Lu, M. K. Mukerjee, M. Rabbi, and R. D. Raizada. Neurophone: brain-mobile phone interface using a wireless eeg headset. In <i>Proceedings of the second ACM SIGCOMM workshop on Networking, systems, and applications on mobile handhelds</i>, pages 3–8. ACM, 2010</p> <p>M. J. Alam, M. Rabbi, and M. S. Rahman. Upright drawings of planar graphs on three layers. <i>Journal of Applied Mathematics &amp; Informatics</i>, 28(56):1347–1358, 2010</p> <p>M. J. Alam, M. A. H. Samee, M. Rabbi, and M. S. Rahman. Minimum-layer upward drawings of trees. <i>J. Graph Algorithms Appl.</i>, 14(2):245–267, 2010</p>   |
| 2008 | <p>M. J. Alam, M. A. H. Samee, M. M. Rabbi, and M. S. Rahman. Upward drawings of trees on the minimum number of layers. In <i>WALCOM: Algorithms and Computation</i>, pages 88–99. Springer, 2008</p>  |

***Lightly peer reviewed Abstracts, Posters, and Workshop papers***

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| 2015 | <p>M. Rabbi, T. Caetano, J. Costa, S. Abdullah, M. Zhang, and T. Choudhury. Saint: A scalable sensing and inference toolkit (poster). In <i>Hotmobile</i>, 2015</p>  |
| 2014 | <p>M. Rabbi and S. I. Ahmed. Sensing stress network for social coping. Accepted for CSCW Interactive Poster Session, 2014</p>  |
| 2013 | <p>S. Vaida, M. Matthews, S. Abdullah, M. C. Xi, M. Green, W. J. Jang, D. Hu, J. Weinrich, P. Patil, M. Rabbi, et al. Moodrhythm: tracking and supporting daily rhythms. In <i>Proceedings of the 2013 ACM conference on Pervasive and ubiquitous computing adjunct publication</i>, pages 67–70. ACM, 2013</p> <p>S. Vaida, T. Choudhury, G. Gay, M. Matthews, P. Adams, M. Rabbi, J. Pollak, M. C. Chi, M. Green, H. Lu, N. D. Lane, M. Lin, and A. T. Campbell. Personal informatics can be stressful: Collecting, reflecting, and embedding stress data in personal informatics. In <i>CHI 2013 workshop on Personal Informatics in the Wild: Hacking Habits for Health &amp; Happiness, Paris, France</i>, April 2728, 2013</p> |

M. Rabbi, C. wen Yuan, and K. Kaipaien. An exploratory study to identify opportune moments in everyday life to promote healthy eating. Poster in ISBNPA, 2013

## Skills

Platforms: Amazon Mechanical Turk, Android, WinBUGS, Web.py, D3

Programming: Matlab, R, C/C++, Java, Python, OpenGL, Shell Scripting, JavaScript, Latex

Evaluation and methodology: Randomized experiment design, Qualitative inquiry (daily diary study, semi-structured interviewing), Mixed-method, N of 1 evaluation

## Awards

- Part of the winning team of \$100K Heritage Open mHealth Challenge, 2013
- Most helpful summer intern (among 60 student-interns) at AT&T Labs Research, 2012
- Dean's list on the year 2004 at Bangladesh Uni. of Engr. & Tech.

## Talks

- Talk on MyBehavior at HCI Seminar of *University of Rochester*, 2013
- Talk on MyBehavior at Information Science Brown-bag Series at *Cornell University*, 2013
- Talk on Mobile Phone Sensing at the Computer Science Seminar at *Bangladesh Uni. of Engr. & Tech.*, 2012
- Talk on Passive Assessment of Mental and Physical Well-being at *Ubicomp*, 2011
- Talk on Passive Assessment of Mental and Physical Well-being at Information Science Breakfast Series in *Cornell University*, 2011

## Selected Press Coverage

- Virtual Companion, AT&T Innovation Showcase “Connecting Your World”, 2013
- Teaching old microphones new tricks, The Economist, 2013
- Smartphone that feels your strain, New Scientist, 2012
- Voice-Stress Software Is Put to the Test, PhysOrg and ACM Tech, 2012
- Monitoring Mental Health from Your Pocket, Cornell Chronicle, 2011
- Neural Phone is featured in The Cyborg in us all, the NYTimes Magazine, 2011
- An App That Reads Your Feelings Through Your Voice, Fast Co’s Co.Exist piece, 2011
- Cellphone Apps to Track Our Health, EarthSky, 2011
- Mobile Phone Mind Control, Technology Review, 2010

## Students advised

- Brian Lin, Undergraduate student at Cornell University, *Fall 2011, Spring 2012, Fall 2012*
- Jan Cardenas, Undergraduate student at Cornell University, *Fall 2012*
- Chantelle Farmer, MPS student at Information Science, *Spring 2013*
- Thiago Caetano, Undergraduate visiting student from Universidade Estadual de Campinas at Cornell University, *Summer 2013*
- Max Schachere, High School student from Hawken School, Ohio, *Summer 2013, Summer 2014*
- Shankar Athinarayanan, Undergraduate student at Cornell University, *Fall 2013, Spring 2014, Fall 2014, Spring 2015*
- Lily Gao, UX designer, Undergraduate student at Cornell University, *Fall 2014*
- Shreya Sitaraman, UX designer, Undergraduate student at Cornell University, *Summer 2014*
- Yaxian Xie, UX designer, Masters student at Cornell University, *Spring 2015, Summer 2015*
- Jiaming Zhang, UX designer, School of Human Ecology, *Summer 2015*

## Service

Reviewer: Ubicomp 2015, CHI 2015, CHI 2014, Ubicomp 2014, UIST 2014, CHI 2013, Mobilecase 2013, Ubicomp 2013, Ubicomp 2012, Pervasive 2012, ACII 2011, International Journal of Distributed Sensor Networks, Pervasive and Mobile Computing special issue on Nokia Mobile Data Challenge, ACM Transactions on Interactive Intelligent Systems

Program Committee: Affective Computing and Intelligent Interaction (ACII 2011), Workshop on Human And Technology (WHAT 2013)

## Selected Graduate Courses

Computer Science: Artificial Intelligence, Machine Learning, Probabilistic Graphical Models, Numerical Linear Algebra, Natural Language Processing, Computational Social Science, Networks, Decision Theory

Others: Qualitative Methods; Quantitative Methods (experiment design) in Psychology; Human-Computer Interaction; Theories of Information, Technology and Society

## Reference

- Tanzeem Choudhury, Associate Professor at Department of Information Science, Cornell University
- Andrew Campbell, Professor at Computer Science, Dartmouth College
- Mi Zhang, Assistant Professor at Dept. of Electrical and Computer Engineering, Michigan State University

Last updated: March 1, 2017