BIOGRAPHICAL SKETCH

NAME: Adibuzzaman, Mohammad

eRA COMMONS USER NAME (credential, e.g., agency login): madibuzz

POSITION TITLE: Research Scientist

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (*if applicable*)	Completion Date MM/YYYY	FIELD OF STUDY
Bangladesh University of Engineering and Technology, Dhaka, Bangladesh	B.Sc	01/2008	Computer Science and Engineering
Marquette University, Milwaukee, WI, USA	M.Sc.	05/2012	Computational Sciences
Marquette University, Milwaukee, WI, USA	Ph.D.	05/2015	Computational Sciences

A. Personal Statement

I am a computational scientist by training, and have specialization in healthcare data infrastructure for high performance computing and mathematical modeling of physiological parameters. My previous works focused on developing computational methods for analyzing vital signs for clinical decision making, including mathematical modeling of arterial blood pressure data for detection of hemorrhage, detection of pain from facial images, and developing high performance computing environment to run those models. More recently, my focus has shifted on integrating medical device data with other sources of data to map treatment with outcome and identifying causation from these observational data for translational clinical research.

1. **Adibuzzaman M.**, Musselman, K., Johnson, A., Brown, P., Pitluk, Z., Grama. A., Closing the Data Loop: An Integrated Open Access Analysis Platform for the MIMIC Database. Proceedings of Computing in Cardiology, Vancouver, 2016.

2. **Adibuzzaman, M.**, DeLaurentis, P., Hill, J., Brian D. Benneyworth, B., Big data in healthcare– the promises, challenges and opportunities from a research perspective: A case study with a model database. Washington DC., AMIA Annual Symposium, 2017.

3. Bikak, M., **Adibuzzaman, M.**, Yuehwern, Y., Jung, Y., Bareinboim, E., Regenerating evidence from landmark trials in ARDS using Structural Causal Models on Electronic Health Record. American Thoracic Society Conference, San Diego, 2018.

B. Positions and Honors

Positions and Employment

2007–2009	Software Engineer, AfriGIS Bangladesh, Dhaka, Bangladesh.
2009–	Lecturer, University of Asia Pacific, Dhaka, Bangladesh
2010–	Junior Research Intern, National University of Singapore, Singapore
2011–	Instructor, Marquette University, Milwaukee, WI, USA
2012–	Research Assistant, International Breast Cancer Research Foundation and Marquette University, Milwaukee, WI, USA
2010–2015	Teaching Assistant, Marquette University, Milwaukee, WI, USA
2013–2014	Oak Ridge Institute of Science and Engineering Fellow, US Food and Drug Administration, White Oak, MD, USA
2015–2017	Assistant Research Scientist, Purdue University, West Lafayette, IN, USA
2018–present	Research Scientist, Purdue University, West Lafayette, IN, USA

Other Experience and Professional Memberships

2014–	Member, Association for Computing Machinery (ACM)
2016–	Member, Institute of Electrical and Electronics Engineers (IEEE)
2017–	Member, American Medical Informatics Association (AMIA)
2017–	Member, Intensive Care Unit Working Group, AMIA

Honors

2010	Best poster award at Forward Thinking Poster Session, Marquette University, WI
2011	Best international poster award at Forward Thinking Poster Session, Marquette University, WI
2012	Nominated for best paper award in CHI, Austin, TX
2013	Best paper award in ACM RACS, Montreal, Canada
2013–2014	ORISE Fellowship, US FDA, White Oak, MD

C. Contribution to Science

1. My early contributions to science included affective computing for clinical application, including pain detection from facial images for breast cancer patients, multi-modal emotion detection using mobile sensors, and detection of vital signs, including heart rate, and oxygen saturation using smart phone. I served as a primary investigator or co-investigators in all these studies. These projects were awarded best paper awards, and were highly recognized.

    a. Haque, M., Kawsar, F., **Adibuzzaman, M.**, Ahamed, S., Love, R., Dowla, R., Roe, D., Hossain, S. and Selim, R., Findings of e-ESAS: A Mobile Based Symptom Monitoring System for Breast Cancer Patients in Rural Bangladesh. Proceedings of CHI 2012 **(Nominated for best paper award)**, 899–908, Austin, USA.
    b. **Adibuzzaman, M.**, Jain, N., Steinhafel, N., Haque, M., Ahmed, F., Ahamed, S.I., Love, R., Towards In Situ Affect Detection in Mobile Devices: A Multimodal Approach. Proceedings of RACS 2013 **(Best paper award)**, Montreal, Canada.
    c. **Adibuzzaman, M**, Jain,N., Steinhafel, N., Haque, M., Ahmed, F., Ahamed, S.I., Love, R., In-situ Affect Detection in Mobile Devices: A Multimodal Approach for Advertisement Using Social Network. ACM SIGAPP Applied Computing Review, 13(4): 67-77 (2013).
    d. **Adibuzzaman, M.**, Ostberg, C., Ahamed, S., Povinelli, R., Sindhu, B., Love, R., Kawsar, F. and Ahsan, G.M.T., Assessment of Pain Using a Smart Phone. Proceedings of COMPSAC, 2015.
    e. **Adibuzzaman, M.**, Ahamed, S.I. and Love, R., A Personalized Model for Monitoring Vital Signs using Camera of the Smart Phones. Proceedings of SAC, 2014, 444–449, Seoul, Korea.
    f. Haque, M.M., Kawsar, F., **Adibuzzaman, M.**, Uddin, M.M., Ahamed, S.I., Love, R., Hasan, R., Dowla, R., Ferdousy, T. and Salim, R., e-ESAS: Evolution of a Participatory Design- based Solution for Breast Cancer (BC) Patients in Rural Bangladesh. Personal and Ubiquitous Computing, 19(2): 395-413 (2015).
    g. Love, R.R., Ferdousy, T., Paudel, B.D., Nahar, S., Dowla, R., **Adibuzzaman, M.**, Ahsan, G.M.T., Uddin, M., Salim, R. and Ahamed, S.I., Symptom Levels in Care-Seeking Bangladeshi and Nepalese Adults With Advanced Cancer. Journal of Global Oncology, 2016.

2. The works described above focused on sensors that are available in the smart phones such as camera and accelerometer. However, due to the limitation of sensors and data quality in mobile environment, my second phase of research work focused on other sources of data for clinical decision making. I started to look into the mathematical modeling and understanding of the algorithms for transnational research. In this area, I was also looking into these algorithms from a regulatory perspective while working at the US Food and Drug Administration (US FDA). I was a the lead researcher for all of these publications.

    a. **Adibuzzaman, M.**, Kramer, G.C., Galeotti, L., Merrill, S.J., Strauss, D.G. and Scully, C.G., The Mixing Rate of the Arterial Blood Pressure Waveform Markov Chain is Correlated with Shock Index During Hemorrhage in Anesthetized Swine. Proceedings of EMBC, 2014, Chicago, USA.
    b. **Adibuzzaman, M.**, Strauss, D.G., Merrill, S., Galeotti, L., Scully. C.G., Evaluation of Machine Learning Algorithms for Multi-parameter Patient Monitoring. Student Poster Competition at the US

FDA, 2014.

c. Collar, B, Bikak, M., Brown, P, Pitluk, Z., **Adibuzzaman, M.**, Second Largest Eigenvalue of the Transition Probability Matrix for the Markov Chain Constructed from the Arterial Blood Pressure Waveform is Not Correlated to Shock Index in Hemorrhagic Human Subjects. Aisthesis, vol. 9, no. 1.

d. Chen, Y., Wang, X., Jung, Y., Abedi, V., Zand, R., Bikak, M., **Adibuzzaman, M.**, Classification of Short Single Lead Electrocardiograms (ECGs) for Atrial Fibrillation Detection using Piecewise Linear Spline and XGBoost. Physiological Measurement, 2018 (to appear).

3. As I was developing the computational models and mathematical concepts for clinical applications, I realized there is a big gap in high performance computing infrastructure for transnational clinical research for reproducibility and validity. Consequently, my recent works are focusing on developing these large infrastructures with advanced database technologies such as SciDB and integration of data sets for seamless flow of information, with causal understanding of the the machine learning algorithms with structured causal models.

   a. **Adibuzzaman, M.**, Haque, M., Zink, R., A Comprehensive Approach for Evidence-based Medical Device Alarm Management. Proceedings of NIH-IEEE 2015 Strategic Conference on Health care Innovations and Point-of-Care Technologies for Precision Medicine, 2015.

   b. **Adibuzzaman M.**, Musselman, K., Johnson, A., Brown, P., Pitluk, Z., Grama. A., Closing the Data Loop: An Integrated Open Access Analysis Platform for the MIMIC Database. Proceedings of Computing in Cardiology, 2016.

   c. Jung, Y., Khan, B., **Adibuzzaman, M.**, Yih, Y., Structured Causal Model for Leveraging Observational Data Complementary to Randomized Controlled Trial. Purdue IEGSO (Industrial Engineering Graduate Student Organization) Poster Competition, 2017.

   d. **Adibuzzaman, M.**, DeLaurentis, P., Hill, J., Brian D. Benneyworth, B., Big data in healthcare– the promises, challenges and opportunities from a research perspective: A case study with a model database. Washington DC., AMIA Annual Symposium, 2017.

   e. Bikak, M., **Adibuzzaman, M.**, Yuehwern, Y., Jung, Y., Bareinboim, E., Regenerating evidence from landmark trials in ARDS using Structural Causal Models on Electronic Health Record. American Thoracic Society Conference, San Diego, 2018.

Complete List of Published Work in MyBibliography:
https://scholar.google.com/citations?user=me_HJ54AAAAJ&hl=en

D. Research Support

Ongoing Research Support

Discovery Park Integrative Data Science Initiative, Purdue University Bareinboim (PI) 06/01/18–
Causally-driven Healthcare Science – From Observational and Experimental Studies to Personalized and Improved Patient Outcomes. ($300,000) (Role: Co-PI)

University Core Facility Research Equipment Program, Purdue University Griffin (PI) 03/01/18–
Regenstrief Information Commons: A cloud computing infrastructure for reproducibility and share-ability. ($100,000) (Role: Co-PI)

NSF CSSI Griffin (PI) Under review
Software for Integrated Data Driven Reproducible Research.($2,000,000) (Role: Co-PI)

Regenstrief Center for Healthcare Engineering (RCHE) Internal, Adibuzzaman (PI)05/01/17– A novel approach for identifying causation from observational data complementary to randomized controlled trial. (Role: PI)

Regenstrief Center for Healthcare Engineering (RCHE) Internal, Adibuzzaman (PI) 05/01/17–08/01/17
Atrial fibrillation (AF) detection from electrocardiogram (ECG) data. (Role: PI)