JESSICA SHARMIN RAHMAN, AFHEA

PhD Candidate

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EXPERIENCE

CERC Fellow Health Intelligence

Commonwealth Scientific and Industrial Research Organisation (CSIRO)

November 2021 – Present

- Develop, validate and implement novel and interpretable machine learning algorithms and workflows for applications in healthcare such as improving productivity and efficiency, informing treatment effectiveness, risk stratification and clinical decision support.

Subject Matter Expert

OpenLearning Limited

May 2021 – Present

- Provided expertise and content in designing online course CS101 - Programming and Computational Thinking
- Assisted in preparing 10 lecture modules on history of computing, machine language, C and Python programming language
- Reviewed overall course structure

Lecturer

The Australian National University

February 2021 – August 2021

- Lecturer for the Fuzzy Logic Section of COMP4660/8420 Neural Networks, Deep Learning and Bio-inspired Computing
- Prepared 5 lecture modules and delivered in online environment of 300 students
- Prepared assignment content and resources
- Prepared and reviewed lab materials, final examination questions
- Marked final examination

Chief Academic Tutor

The Australian National University

February 2019 – August 2021

- Chief tutor for COMP1710/6780 Web Development and Design and COMP3710 Topics in Computer Science
- Facilitated online learning activities for a class of 280 students
- Assisted with preparing course and lab content
- Led a team of 10 tutors to prepare and deliver lab tutorials and marking assignments.
- Conducted and marked oral examinations and final examination scripts
- Provided practical training on wearable devices and guided students on running experiments

EDUCATION

Doctor of Philosophy, Engineering and Computer Science

The Australian National University

December 2017 – Present

Bachelors of Science (Honours) in Computer Science and Engineering

University of Dhaka

January 2012 – March 2016

SKILLS

Physiological Signal Processing
EEG, fNIRS, EDA, BVP, Eye Gaze Analysis
Machine Learning
Artifical Neural Networks
User Experience Research
Qualitative Analysis
Quantitative Analysis
Prototyping
Python
Matlab
C/C++
Pandas
Numpy
Scikit-learn
Tensorflow
Keras
Jupyter
HTML
CSS
JavaScript
PHP

ACHIEVEMENTS

- Winner of People's Choice Award in ANU 3 Minute Thesis Finals (2020)
- Selected to represent The Australian National University in Global Young Scientists' Summit (GYSS) in Singapore (2020)
- Recipient of Australian Government Research Training Program International Fee Offset and Stipend Scholarship (2017-2021)
- 1st Place in Australian Dance Crew Championship ACT Qualifier (2021)
- Recipient of RFL Inspiring Women Award in Category: Leaders of Tomorrow
- Recipient of EBL-DUAA Inspiration Scholarship (2015)
- Winner of Startup DU: Business Process Tool Competition (2014)

EXPERIENCE

Research Assistant

Commonwealth Scientific and Industrial Research Organisation (CSIRO)

February 2020 – May 2020

- Team member in Immersive Analytics Lab's project Immersive Data Visualisation of Population-Scale Genome Architectures
- Conducted interviews of experts to gather requirements for the project
- Performed qualitative analysis on the collected data and provided design recommendations
- Prepared evaluation reports

Academic Tutor

The Australian National University

July 2018 – December 2020

- Tutor for COMP3900/6390 Human Computer Interface Design and Evaluation and COMP1710/6780 Web Development and Design
- Delivered tutorials in both in-person and online learning environment
- Conducted oral examinations
- Marked assignments and final examination scripts

SELECTED PROJECTS

Music and Emotion

April 2019 – present

- Collected physiological signals such as GSR, HRV, EEG, functional imaging of brain and eye gaze behavior to understand effects of music in identifying emotion from different categories of videos
- Performed qualitative, quantitative and visual analysis on the data
- Developed machine learning methods to computationally understand the effects of music on human physiological response

Immersive Data Visualisation of Population-Scale Genome Architectures

February 2020 – May 2020

- Conducted interviews of experts for the project
- Performed qualitative analysis on the data to identify recommendations for the visualization methods

Understanding psychophysiological behavior during reading and music listening

May 2018 – December 2018

- Collected physiological signals such as GSR, HRV, EEG and eye gaze behavior to understand effects of different music genres on emotional response and reading behavior
- Analyzed the physiological signals using machine learning techniques to predict participants' emotional response

AFFILIATIONS

- Associate Fellow of the Higher Education Academy (AFHEA)
- Associate Chair of CHI '22, DIS '21
- Logistics Chair of OzCHI '20
- Program Committee Member of CHI '22, DIS '21, ICONIP '19
- Student Volunteer of CSCW '21, IUI '21
- Reviewer for Elsevier Neural Networks Journal, ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT) Journal, CHI '21, INTERACT '21, DIS '21, ICMI '21, OzCHI '20, OzCHI '19, ICONIP '19
- Member of the Association for Computing Machinery (ACM)
- Member of the Institute of Electrical and Electronics Engineers (IEEE)
- Dance Crew Member at Project Beats Dance Studio (2019 - present)

SELECTED TALKS

- Oral Presentation at CHI Conference on Human Factors in Computing Systems, CHI'21.
- Invited Talk at ABC Science Ockham's Razor
- Invited Talk at Global Young Scientists' Summit 2020
- Oral Presentation at 3-minute thesis 2020
- Invited Talk at Ada Lovelace Celebration 2020
- Oral Presentation at 32nd Australian Conference on Human-Computer-Interaction, OZCHI'20
- Oral Presentation at The 2020 International Joint Conference on Neural Networks, IJCNN 2020
- Oral Presentation at The 2019 International Joint Conference on Neural Networks, IJCNN 2019

SELECTED PROJECTS

Advanced Analytics to Reveal Novel Insights into 'Worth of Water'

March 2017 – August 2017

- New South Wales Department of Primary Industries (Water) project in Collaboration with Advanced Analytics Institute, UTS, Sydney
- Applied visualization techniques to identify useful insights on water quality of Australia using Javascript

Kinect Based Fruit Names and Etiquette Learning app

July 2015

- Windows application built using C# and Kinect V2 sensors
- Conducted observation, interviews and paper prototype testing to gather requirements to build educational applications for children with autism

PUBLICATIONS

- Rahman, J. S., T. Gedeon, S. Caldwell, and R. Jones (2021). "Can Binaural Beats Increase Your Focus? Exploring the Effects of Music in Participants' Conscious and Brain Activity Responses". In: *Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems*. CHI'21. Online.
- Rahman, J. S., T. Gedeon, S. Caldwell, R. Jones, and Z.Jin (2021). "Towards Effective Music Therapy for Mental Health Care Using Machine Learning Tools: Human Affective Reasoning and Music Genres". In: *Journal of Artificial Intelligence and Soft Computing Research* 11.1, pp. 5–20.
- Rostov, M., M. Z. Hossain, and J. S. Rahman (2021). "Robotic Emotion Monitoring for Mental Health Applications: Preliminary Outcomes of a Survey". In: *18th IFIP TC13 International Conference on Human-Computer Interaction*. INTERACT'21. Bari, Italy.
- R.Chu et al. (2021). "Detecting Lies: Finding the Degree of Falsehood from Observers' Physiological Responses". In: *2021 IEEE International Conference on Systems, Man, and Cybernetics (SMC)*.
- Rahman, J. S., T. Gedeon, S. Caldwell, and R. Jones (2020). "Brain Melody Informatics: Analysing Effects of Music on Brainwave Patterns". In: *2020 International Joint Conference on Neural Networks (IJCNN)*, pp. 1–8.
- Rahman, J. S., M. Z. Hossain, and T. Gedeon (2020). "Are paired or single stimuli better to recognize genuine and posed smiles from observers' GSR". in: *Proceedings of the 32nd Australian Conference on Human-Computer-Interaction*. OZCHI'20. Online.
- Brewer, M. and J. S. Rahman (2020). "Pruning Long Short Term Memory Networks and Convolutional Neural Networks for Music Emotion Recognition". In: *International Conference on Neural Information Processing*. Springer, pp. 343–352.
- Renkin, M. and J. S. Rahman (2020). "Improving the Stability of a Convolutional Neural Network Time-Series Classifier Using SeLU and Tanh". In: *International Conference on Neural Information Processing*. Springer, pp. 788–795.

OUTREACH ACTIVITIES

- Mentor (Senior tutor) at ANU Centre for Teaching and Learning tutor training program 2021
- Mentor at ANU 3-Minute Thesis College Final 2021
- Volunteer at Canberra Street Dance Fest 2021
- Vice President at CSEDU Students' Club 2015

REFEREES

Prof. Tom Gedeon
@ Curtin University
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Dr. Sabrina Caldwell
@ The Australian National University
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Dr. Henry Gardner
@ The Australian National University
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Dr. Duncan Stevenson
@ The Australian National University
duncan.stevenson@anu.edu.au

- Rahman, J. S., M. Z. Hossain, and T. Gedeon (2019). “Measuring Observers’ EDA Responses to Emotional Videos”. In: *Proceedings of the 31st Australian Conference on Human-Computer-Interaction*. OZCHI’19. Fremantle, WA, Australia, pp. 457–461.

- Rahman, J. S., T. Gedeon, S. Caldwell, R. Jones, M. Z. Hossain, et al. (2019). “Melodious Micro-frissons: Detecting Music Genres From Skin Response”. In: *2019 International Joint Conference on Neural Networks (IJCNN)*, pp. 1–8.

- Rahman, J. S., J. Li, et al. (2018). “Connectivity Based Method for Clustering Microbial Communities from Metagenomics Data of Water and Soil Samples”. In: *2018 International Joint Conference on Neural Networks (IJCNN)*. IEEE, pp. 1–8.

- Chowdhury, A., J. S. Rahman, and M.S. Hawlader (2016). “Well-connectedness-a novel measure for improving protein complex detection from PPI network”. In: *2016 IEEE Conference on Computational Intelligence in Bioinformatics and Computational Biology (CIBCB)*. IEEE, pp. 1–6.