Raju Maharjan

maharrx@gmail.com +4591862561 www.rajumaharjan.com

PROFILE

My current research lies within the intersection of Human-Computer Interaction (HCI) and Ubiquitous Computing (UbiComp) and focuses on the design of technologies to support health and wellbeing. My background in computer science and multimedia design, combined with several years of academic and professional experience in research and design of UI/UX in the healthcare context, enables me to design technologies that work for both patients and healthcare professionals.

EDUCATION

11/2021 (Expected)	Ph.D., **Digital Health Technology**, Technical University of Denmark
Dissertation Title	Speech-Enabled Coversational Agents to Support the Self-Report of Mental Health & Wellbeing
Supervisors	Jakob E. Bardram & Per Bækgaard
01/2017	MA, Web & Multimedia Design, Touro College, NY
06/2013	BSc, Dynamic Web Design, The Graduate Center, The City University of New York
08/2009	AAS, New Media Technology, LaGuardia Community College, The City University of New York

SKILLS

Prototyping	Conversational Agents, Chatbots, Mobile Application, Web Application, 3D Models
Design	Dialogflow, Figma, Axure, Illustrator, Photoshop, Indesign, After Effects, Premiere Pro, Maya
Development	Javascript, PHP, HTML, CSS, MySQL/NoSQL, Java
Research	Qualitative, Quantitative and Mixed-Method Study Design, User-Centered Design, Design Thinking, Participatory Design, Survey, Workshop, Interviews, Focus Groups
Data Analysis	Text Mining, Topic Modeling, Data Visualization, Thematic Analysis, R, Python, MS Excel

AWARDS & HONORS

2012 – 2013	**Thomas W. Smith Fellowship**, The City University of New York, NY
12/12/2012	**Promise Prize**, Code for Change, New York University, NY

RESEARCH EXPERIENCE

08/2019 – Present **Ph.D. Research**, SOFIA

It is a cross-disciplinary research project involving general practitioners, clinical pharmacologists, social workers, and psychiatrists, aiming to improve the quality of life of people living with mental illness by promoting effective communication and collaboration between patients and clinicians. As a part of this study, two empirical studies were carried out to evaluate a Conversational Agent (CA)'s the feasibility in collecting mental health self-reports.

The first study developed a WHO-5 questionnaire-driven CA with state-based and free-form conversational designs. A lab-based within-group experiment was conducted to evaluate the designs in collecting self-reports accurately compared to the paper-based method. The strong correlation between self-reports collected via both designs of the agent and on the paper-based scale suggested the accuracy of the state-of-the-art CAs in collecting self-reports.

The second study developed a CA that enabled daily self-report of wellbeing by asking three open-ended questions and an additional questionnaire fortnightly. The system's ecological validity was evaluated by conducting a two-arm mixed-method field deployment study involving people living with affective disorders. Results from this study provided qualitative and quantitative evidence for users' acceptance and the feasibility of the technology for the self-report of mental health and wellbeing in the home context.

02/2018 – 07/2019 **User Research & System Design**, mCardia

The goal of this research project was to design, develop, and evaluate the clinical feasibility of a smartphone-based ambulatory heart monitoring system that collects contextualized Electrocardiogram (ECG) data for arrhythmia monitoring and diagnosis.

Adopting the user-centered design approach, a series of co-design workshops with both patients and clinicians were conducted to develop a Requirement Analysis Document (RAD) for the design of the system.

According to the requirements, the prototype of the *mCardia* system was designed. It included (i) a patient-facing mobile app that enabled real-time reflection on the cardiovascular data (e.g., Heart Rate (HR), Heart Rate Variability (HRV), and MET level collected via a two-channel Holter device and contextual information such as patient self-reports, sleep and step counts gathered via the mobile app) and (ii) a web application that allowed clinicians to analyze and annotate the ECG data with the contextual information.

The system's clinical feasibility and usability were evaluated for longitudinal arrhythmia screening under free-living ambulatory conditions demonstrating longitudinal patient engagement and usefulness of the context for the manual analysis of ECG.

06/2011 – 01/2012 **Director of Technology**, Artbox

Artbox is an National Science Foundation (NSF)-funded app development project with an aim to create an engaging online community of artists and art enthusiasts. The challenge was to engage a diverse group of users, help them make connections with each other, and encourage them to keep coming back to the app.

To come up with the solution, we conducted semi-structured interviews with artists and patrons to investigate how they use technology and social media. We also conducted competitor analysis and visited museums, auction houses, and art exhibitions to conceptualize the business model of the app. Based on the findings, a unique concept of a local, social, and mobile app was developed.

TEACHING EXPERIENCE

Student Supervision, Technical University of Denmark

07/2019 – 12/2019 Chen Wang, MSc, Digital Media Engineering

Teaching Assistant, Technical University of Denmark

01/2019 – 03/2019 Personal Data Interaction for Mobile & Wearables

01/2019 – 01/2019 User Experience Engineering

09/2018 – 11/2018 User Experience Design Prototyping

PUBLICATIONS

Journals

Raju Maharjan, Kevin Doherty, Darius Adam Rohani, Per Bækgaard, and Jakob E. Bardram. 2021. Experiences of a Speech-Enabled Conversational Agent for the Self-Report of Wellbeing Among People Living with Affective Disorders: An In-The-Wild Study. *ACM Trans. Interact. Intell. Syst.* DOI:https://doi.org/10.1145/3484508 [ACCEPTED]

Devender Kumar, Raju Maharjan, Alban Maxhuni, Helena Dominguez, Anne Frølich, and Jakob E. Bardram. 2021. mCardia: A Context-Aware Ambulatory ECG Collection System for Arrhythmia Screening. *ACM Health* [ACCEPTED]

Conferences

Raju Maharjan, Darius Adam Rohani, Per Bækgaard, Jakob Bardram, and Kevin Doherty. 2021. Can we talk? Design Implications for the Questionnaire-Driven Self-Report of Health and Wellbeing via Conversational Agent. *CUI 2021 - 3rd Conference on Conversational User Interfaces*. Association for Computing Machinery, New York, NY, USA, Article 5, 1–11. DOI:https://doi.org/10.1145/3469595.3469600

Giovanna Nunes Vilaza, Raju Maharjan, David Coyle, and Jakob Bardram. 2020. Futures for Health Research Data Platforms From the Participants' Perspectives. In *Proceedings of the 11th Nordic Conference on Human-Computer Interaction: Shaping Experiences, Shaping Society* (*NordiCHI '20*). Association for Computing Machinery, New York, NY, USA, Article 39, 1–14. DOI:https://doi.org/10.1145/3419249.3420110

Workshops

Raju Maharjan, Per Bækgaard, and Jakob E. Bardram. 2019. "Hear me out": smart speaker based conversational agent to monitor symptoms in mental health. In *Adjunct Proceedings of the 2019 ACM International Joint Conference on Pervasive and Ubiquitous Computing and Proceedings of the 2019 ACM International Symposium on Wearable Computers* (*UbiComp/ISWC '19 Adjunct*). Association for Computing Machinery, New York, NY, USA, 929–933. DOI:https://doi.org/10.1145/3341162.3346270

Raju Maharjan, Per Bækgaard, and Jakob E. Bardram. 2018. Leveraging Multi-modal User-labeled Data for Improved Accuracy in Interpretation of ECG Recordings. In *Proceedings of the 2018 ACM International Joint Conference and 2018 International Symposium on Pervasive and Ubiquitous Computing and Wearable Computers* (*UbiComp '18*). Association for Computing Machinery, New York, NY, USA, 636–641. DOI:https://doi.org/10.1145/3267305.3267548

PAPER REVIEWING

2019 – Present	ACM Conference on Human Factors in Computing Systems (CHI)
2021	ACM International Symposium on Wearable Computers (ISWC)
2020	EAI International Conference on Pervasive Computing Technologies for Healthcare

COMMUNITY ACTIVITIES

2019	Student Volunteer, Conference on Ubiquitous, Pervasive and Wearable Computing (Ubicomp)
2018	Summer School, Humanistic HCI, UBISS '18, 9th International UBI Summer School

PROFESSIONAL EXPERIENCE

10/2017 – 01/2018	Frontend Developer, Google (Contract), CA
03/2015 – 08/2017	UI/UX Engineer, Abbott Point of Care, NJ
08/2013 – 07/2014	Frontend Developer, Harland Clarke, TX
04/2012 – 05/2012	Frontend Developer, HIV/AIDS Services, NYC Human Resource Administration, NY
06/2011 – 01/2012	Director of Technology, Artbox – NYC College of Technology, NY
04/2011 – 01/2012	Web Designer & Developer, NYC College of Technology, NY
11/2009 – 09/2010	Web Developer, IBREA Foundation, NY
11/2009 – 10/2010	Web Developer, Iced Media and Boom Digital Ventures, NY
07/2007 – 05/2008	Technology Mentor, The City University of New York Research Foundation, NY