

KEITH REBELLO

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EDUCATION

Northeastern University, Boston MA.

Khoury College of Computer Sciences

Candidate for *Master of Science in Artificial Intelligence*

Courses: Machine Learning, AI in HCI, Theories, and Methods in HCI

September 2021 - Present

Expected Graduation: 2023

GPA: 3.8

Symbiosis University, Pune, IN

Symbiosis Center for Distance Learning

Post Graduate Diploma in Basic Counseling and Child Psychology

Courses: Foundations to Mental Health, Psychological Testing, Basic Counseling

2021

GPA: 88%

University of Mumbai, Mumbai, IN

MCT's Rajiv Gandhi Institute of Technology (RGIT)

Bachelor of Engineering in Information Technology

Courses: Artificial Intelligence, Soft Computing, Data Structures and Algorithms

2020

GPA: 8.5/10

TECHNICAL KNOWLEDGE

Domains:	HCI, HRI, Conversational AI, NLP, Social Robotics, Virtual Agents, Mental Health, Emotional Wellbeing
Languages:	Python, JavaScript, C, Java, R programming, HTML, CSS, PHP
Data Processing:	Tableau, R, Python
Skills:	NLP, DL, Machine Learning, Soft Computing, Cloud (AWS, GCP, Azure), Human subject research, User study design, 3D modeling and Robotics.
Libraries:	MatPlotLib, Seaborn, TensorFlow, Keras, PyTorch, Scikit-learn, Turicreate, Jax, Flask, Selenium
Certifications:	Machine Learning, Natural Language Processing, Advanced Machine Learning, AI in Medicine
NLP Domains:	NLU, NLG, Dialogue Management, Question Answering, Sentiment Analysis, Knowledge Extraction.
Software:	ROS, Unity, Blender, Choregraphe, Furhat-SDK, Maya

WORK EXPERIENCE

Research Assistant, Relational Agents Group Lab at Northeastern University, Boston, MA February 2022– Present

- Managed recruitment and running of 5 human subject research studies that varied in topic from persuasive robotics to virtual agent studies and varied in size from pilot studies with 12 participants to 36 participants.
- Designed and conducted a design workshop for 8 participants to gain feedback on new features for a spirituality and community-based app to promote health and wellbeing among the underserved older black community as part of the “Smart Connected Churches” project.
- Assisted with debugging and testing for the “Smart Connected Churches” project.
- Developed a server and logging tool to simplify the generation of databases, and robot navigation for within-subjects, controlled experiment design that studies the ability of robots to persuade users to make healthier choices.
- Developed a JavaScript based chatbot and an embodied conversational agent comparing both modalities for a genetic counseling study.

Freelance Data Scientist for a Dubai-based consultancy, Dubai, UAE August 2020 – February 2021

- Built a state-of-the-art AI-powered multi-modal fact-checker for ten thousand concurrent requests with multilingual query support for both English and Arabic.
- Designed the machine learning, natural language processing, and deployment module architectures based on two months of research and development.
- Constructed a server to host and run the software efficiently and to scale for thousands of concurrent requests.

Internship at Discountshop.com/iUrbo, Connecticut, USA/Amsterdam January 2018 - May 2018

- Leveraged hands-on data analytics in e-commerce namely through primary research, processing, and presentation. Responsibilities included web and mobile analytics, automated web crawling, and data extraction.

PUBLICATIONS

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| • Influencing Health Decisions using Robot Counseling, Mobility, and Gesture (Manuscript in Progress) | Nov 2022 |
| • Training lay counselors with virtual agents to promote vaccination (IVA'22) | Sept 2022 |
| • Graph-Based Transfer Learning for Conversational Agents (ICCES'20) | July 2020 |
| • Energy-efficient Face Recognition Authentication System Using Human Detection Internet-of-Things Modules (IEEE) | June 2020 |
| • Emotionally Intelligent Artificially Intelligent Virtual Companion (IJREAM) | May 2020 |

PROJECTS

Multimodal empathic embodied conversational agent for emotional support, Thesis, Northeastern, Solo August 2022 - present

- Developed a multimodal computational model of empathy using PAD space dimensions of emotion, affect regulation, and context-based empathetic response generation.
- Created an empathetic response generation architecture using Hoffman's theory of multi-dimensional empathy.
- Designed a three-arm between subjects experiment to compare the new system with an existing model of empathy and a control. The study is currently submitted for IRB approval and expected to run in February 2023.

Enhancing an Empathic Conversation Agent using Crowdwork, Course Project, Northeastern Sept 22 – Dec 22

- Created a framework for building and continuously training an empathic conversational agent using crowdwork.

- Successfully ran a pilot study with 6 participants that demonstrated the efficacy of using the framework.
- Detection of Human-Likeness in Artificially Generated Text**, Course Project, Northeastern, Solo January 2022 – May 2022
- Implemented a tool for quantifying the “human-ness” of text generated by an artificial language model such as GPT, GPT2, LSTM, GRU etc.
 - Matched results against benchmark scores for artificial text detection with a global accuracy of 86%.
- Multi-label Emotion Classification**, Course Project, Northeastern, Team Lead January 2022 - May 2022
- Created a classifier for detecting multiple emotions from text by using RF Classifiers and a custom Bidirectional LSTM.
 - Verified different emotion classification systems derived from psychology such as Eckman’s 6 emotions, James’ 4 basic emotions, and Richard and Lazarus’ 15 emotions.
- Smart News App**, Hackathon Demo, Rajiv Gandhi, Team Lead May 2019
- Created a news app that attempted to verify the authenticity of a news article using NLP through TensorFlow. Developed in a group of four.
 - Extracted, cleaned and modeled high volumes of unstructured raw text data from online news articles.
 - Won Rs.10,000 for placing first at a city-wide Hackathon for the project. (Won out of fifty grand final entries)
- Error Log Management Software**, Hackathon Demo, Rajiv Gandhi, Team Lead February 2019 – March 2019
- Implemented an Error Log Management Software that used Machine learning and Artificial Intelligence techniques to classify error logs using ELK. Developed in a team of six.
 - Developed a pipeline for ingesting, cleaning and modeling large volumes of server log data from multiple servers.
 - Reached the Grand Finals of a national Hackathon for the project. (Placed third from 150,000 applicant teams)
- Evaluating Trust in Mental Healthcare Conversational Agents**, Course Project, Northeastern September 2021 - December 2021
- Delivered a novel counterbalanced 2x2 within-subjects research study with ten participants to assess the development of trust between two popular conversational agents which focus on mental healthcare using artificial intelligence.
- Emotionally Intelligent Artificially Intelligent Virtual Companion** Final Project, Team Lead August 2018 - October 2020
- Emotional chatbot that senses mood and generates an appropriate response using python developed in a team of three using NLP, graph databases, and theories from neuroscience and psychology. Selected as one of the top five projects from the entire undergraduate department at the institute.
- Sentiment Analysis using ULMFiT** Personal Project, Solo July 2020 – August 2020
- Performed sentiment analysis on Twitter US Airlines Dataset based on the ULMFiT model by Fastai. Achieved a record accuracy of 84.22% relative to other Kaggle submissions for the same dataset.

INTERESTS/ACTIVITIES

- Recipient of the **Khoury Research Apprenticeship** and awarded \$7000 to pursue research at Khoury College.
- Placed 3rd at the Project the Future of Wellbeing 2022 Hackathon organized by **Samsung Research** and the **MIT Media Lab**
- Participant in the **CrowdCamp** workshop at **HCOMP 2022**. Developed a crowd-sourced empathic conversational agent to enhance empathy in conversations between users and the chatbot.
- Top 3 National Grand Finalist (out of 10,000 entries) at the **Smart India Hackathon** for ML-based Error Log Management.
- Winner (out of 50 grand final entries) of *UnScript 2k18* **State-level Hackathon** for Smart News Virtual Agent.