

Agha Ali Raza

Syed Babar Ali School of Science and Engineering
Lahore University of Management Sciences (LUMS)
DHA Phase 5, Khayaban e Jinnah, Lahore, Punjab 54792

Email: agha.ali.raza@gmail.com
agha.ali.raza@lums.edu.pk
Web: http://aghaaliraza.com

Research and Teaching

My research interests include *Speech & Natural Language Processing*, *Speech-based Human Computer Interfaces*, and *Information & Communication Technologies for Development (ICT4D)*. The aim of my research is to enable information access and social connectivity for under-connected and under-served populations (low-literate, low-income, tech naïve, visually impaired, linguistically/socially marginalized, and geographically remote communities, and oral cultures) throughout the developing world. My work focusses on the development of speech-based information services and social networks accessible over simple and feature phones to be used as vehicles for large-scale dissemination of development-related information, pulling information in the form of real-time surveys and for performing randomized controlled trials and demographic studies. These services also provide target marginalized populations with a voice and a digital social identity. My work in Speech and Language technologies is focused on the localization of linguistic resources and techniques to Pakistani context for the development of Speech Recognition, Text-to-Speech, Voice-biometrics, Spoken Term Detection and relevant capabilities. I teach *Natural Language Processing*, *Speech Processing* and *Machine Learning* at graduate and undergraduate levels.

Professional Positions

- Lahore University of Management Sciences (LUMS), Lahore, Pakistan** *Jan 2020 – now*
Assistant Professor, Department of Computer Sciences, School of Science and Engineering (SBASSE)
- Information Technology University, Punjab, Pakistan** *Jun 15 – Dec 19*
Assistant Professor, Computer Science Department
 - Consultant for Gates-funded Digital Financial Services project (with University of Washington)** *2017-18*
Expertise in design for low-literate and non-tech-savvy audiences
 - Consultant and guest lecturer for DFID-funded E-learn Punjab project** *2015-16*
Expertise in telephone-based voice information services, lecture design, and delivery
 - Consultant for Weather Info Services at the Center for Language Engineering (CLE)** *2015-16*
Expertise in design of speech-based human interfaces for low-literate farmers
- Lahore University of Management Sciences (LUMS), Lahore, Pakistan** *Sep 11 – Dec 11*
Teaching Assistant of *Advanced Operating Systems*
- Carnegie Mellon University, Pittsburgh, PA, USA** *Dec 10 – May 11*
Teaching Assistant of *Fundamental Data Structures and Algorithms*
- FAST-NU (National University of Computer & Emerging Sciences) Lahore, Pakistan** *Jan 05 – Jul 10*
 - Lecturer**, Computer Science permanent faculty *Aug 09 – Jul 10*
 - Instructor**, Computer Science permanent faculty *Jul 05 – Jul 09*
 - Lab Instructor**, Computer Logic and Design *Jan 05 – Jun 05*

Education

- Ph.D. in Computer Science (Language Technologies)** *Aug 10 – May 15*
Carnegie Mellon University, Pittsburgh, PA, USA
Thesis: *Viral Entertainment as a Vehicle for Disseminating Core Development Services*
Advisor: Roni Rosenfeld (Professor and Head, Machine Learning Department, CMU)
Committee:
 - Jaime Carbonell (Professor and Director, Language Technologies Institute, CMU)
 - Bill Thies (Microsoft Research New England, US)
 - Bhiksha Raj (Professor, Language Technologies Institute, CMU)
 - Umar Saif (Chairman Punjab IT Board, and Vice Chancellor, Information Technology University)
- Master of Science in Computer Science (MS CS)** *Aug 06 – Jul 09*
National University of Computer & Emerging Sciences-FAST, Lahore, Pakistan
Thesis: *Design and Development of an Automatic Speech Recognition System for Urdu*
Advisors: Sarmad Hussain and Awais Athar
- Bachelor of Science in Computer Science (BS CS)** *Aug 01 – Jul 05*
National University of Computer & Emerging Sciences-FAST, Lahore, Pakistan
Thesis: *Acoustic Direction of Arrival estimation for underground events*
Advisors: Bilal M. Hashmi and Akmal Butt

Grants and Awards

- [1]. **Facebook Research, USD 90,000**, Agha Ali Raza (Co-PI), Ayesha Ali (PI, Lahore University of Management Sciences, Pakistan), Ihsan Ayyub Qazi (Co-PI, Lahore University of Management Sciences, Pakistan), *Countering deepfake misinformation among low digital-literacy populations*, Sep 2020 – Sep 2021.
- [2]. **National Institutes of Health (NIH), USD 250,000**, Agha Ali Raza (Co-PI, Pakistan-side lead PI), Arman Rezaee (PI, University of California, Davis), Mustafa Naseem (Co-PI, University of Michigan, Ann Arbor), *Impact evaluation of Super Abbu: A speech-based MNCH platform in Pakistan*, Sep 2018 – Sep 2020.
- [3]. **National Academies of Sciences, Engineering, Medicine, Keck Futures Initiative (NAKFI), USD 500,000**, Agha Ali Raza (Co-PI, Pakistan-side lead PI), Kentaro Tayoma (PI, University of Michigan, Ann Arbor), Melissa Densmore (Co-PI, University of Cape Town), Mustafa Naseem (Co-PI, University of Michigan, Ann Arbor), Maryam Mustafa (Co-PI, ITU), *Digital Street Theater for Global Maternal and Child Health Education*, Oct 2018 – Oct 2021.
- [4]. **National Center in Big Data and Cloud Computing, Higher Education Commission of Pakistan, PKR 82,000,000**, Agha Ali Raza (Co-PI), Faisal Kamiran (ITU), Saeed Ul Hassan (ITU), Mudassir Shabbir (ITU), *Speech Forensics*, 2018 – 20.
- [5]. **National Research Program for Universities (NRPU) - Higher Education Commission of Pakistan, PKR 4,500,000**, Agha Ali Raza (PI), Saeed Ul Hassan (ITU, CoPI), *An AI-based automatic Urdu plagiarism detection tool for academia using deep learning and big data*, 2019 – 21.
- [6]. **Google Inc., USD 20,000**, Agha Ali Raza (Co-PI, Pakistan-side lead PI), Nithya Sambasivan (PI, Google), Nova Ahmad (Co-PI, North South University), *Technology and Gender Disparity*, Aug 01, 2017 – Oct 15, 2017.
- [7]. **Innovation Fund, UNICEF, USD 100,000**, Agha Ali Raza (PI), *Rah e Maa: IVR services to disseminate birth preparedness awareness to expecting fathers*, Nov 11, 2016 – Nov 10, 2017.
- [8]. **Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), 1 Million Euros**, Agha Ali Raza (Technical Lead), Roni Rosenfeld (PI, CMU), Umar Saif (Co-PI), *Hello Rozgar: Improving Access To Skills Training And Employment Opportunities For Marginalized People*, Jan 01, 2014 – Dec 31, 2015.

Publications

Peer-reviewed Conference Papers and Notes

- [1]. Hira Dharmyal, Ayesha Ali, Ihsan Ayyub Qazi, **Agha Ali Raza**, *Fake Audio Detection in Resource-constrained Settings using Microfeatures*. In the Proceedings of INTERSPEECH 2021, Aug 30 - Sep 03, 2021, Brno, Czechia.
- [2]. Shan M. Randhawa, Tallal Ahmad, Jay Chen, and **Agha Ali Raza**, Karamad: A Voice-based Crowdsourcing Platform for Underserved Populations. In CHI Conference on Human Factors in Computing Systems (CHI'21), May 8-13, 2021, Yokohama, Japan. ACM, New York, NY, USA, 15 pages. <https://doi.org/10.1145/3411764.3445417>.
- [3]. Muhammad Qasim, Haris Bin Zia, Awais Athar, Tania Habib, and **Agha Ali Raza**. Personalized weather information for low-literate farmers using multimodal dialog systems. *International Journal of Speech Technology* (2021): 1-17. <https://doi.org/10.1007/s10772-021-09806-2>.
- [4]. Book Chapter: Aditya Vashistha and **Agha Ali Raza**. (2021). Voice Interfaces for Underserved Communities. In *An Introduction to Development Engineering*. Springer.
- [5]. Namees Hayat Qasmi, Haris Bin Zia, Awais Athar, and **Agha Ali Raza**, *SimplifyUR: Unsupervised Lexical Text Simplification for Urdu*. In 12th International Conference on Language Resources and Evaluation (LREC 2020), Marseille, France.
- [6]. **(Honorable Mention Award)** Mustafa Naseem, Bilal Saleem, Sacha Ahmad, Jay Chen, **Agha Ali Raza**. *An Empirical Comparison of Technologically Mediated Advertising in Under-connected Populations*. In CHI Conference on Human Factors in Computing Systems Proceedings (CHI 2020), April 25–30, 2020, Honolulu, HI, USA, 13 pages. <http://dx.doi.org/10.1145/3313831.3376683>.
- [7]. Maryam Mustafa, Amna Batool, Beenish Fatima, Fareeda Nawaz, Kentaro Toyama, **Agha Ali Raza**. *Patriarchy, Maternal Health and Spiritual Healing: Designing Maternal Health Interventions in Pakistan*. In CHI Conference on Human Factors in Computing Systems Proceedings (CHI 2020), April 25–30, 2020, Honolulu, HI, USA, 13 pages. <http://dx.doi.org/10.1145/3313831.3376294>.
- [8]. Hafiz Rizwan Iqbal, Saad Bin Zahid, **Agha Ali Raza**, *An Unsupervised Spoken Term Detection System for Urdu*. In 7th International Conference on Language and Technology (CLT), 19th - 21st February, 2020, Lahore, Pakistan.
- [9]. Aditya Vashistha, Umar Saif, and **Agha Ali Raza**. *The Internet of the Orals*. In *Communications of the ACM*, November 2019, Vol. 62 No. 11, Pages 100-103. <https://doi.org/10.1145/3343452>.
- [10]. Maryam Mustafa, Amna Batool, and **Agha Ali Raza**. *Designing ICT Interventions for Women in Pakistan*. In *Communications of the ACM*, November 2019, Vol. 62 No. 11, Pages 46-47. <https://doi.org/10.1145/3355696>.
- [11]. Hamid Mehmood, Tallal Ahmad, Lubna Razaq, Shrirang Mare, Maryam Zafar Usmani, Richard Anderson, and **Agha Ali Raza**. 2019. *Towards Digitization of Collaborative Savings Among Low-Income Groups*. In *Proceedings ACM Hum.-Comput. Interact.* 3, CSCW, Article 35 (November 2019), 30 pages. <https://doi.org/10.1145/3359137>.
- [12]. **Agha Ali Raza**, Zain Tariq, Shan Randhawa, Bilal Saleem, Awais Athar, Umar Saif, and Roni Rosenfeld. 2019. *Voice-Based Quizzes for Measuring Knowledge Retention in Under-Connected Populations*. In CHI Conference on Human Factors in

- Computing Systems Proceedings (CHI 2019), May 4–9, 2019, Glasgow, Scotland Uk. ACM, New York, NY, USA, 14 pages. <https://doi.org/10.1145/3290605.3300642>.
- [13]. Aditya Vashistha, Abhinav Garg, Richard Anderson, and **Agha Ali Raza**. 2019. *Threats, Abuses, Flirting, and Blackmail: Gender Inequity in Social Media Voice Forums*. In CHI Conference on Human Factors in Computing Systems Proceedings (CHI 2019), May 4–9, 2019, Glasgow, Scotland UK. ACM, New York, NY, USA, 13 pages. <https://doi.org/10.1145/3290605.3300302>.
- [14]. **Agha Ali Raza**, Awais Athar, Shan Randhawa, Zain Tariq, Muhammad Bilal Saleem, Haris Bin Zia, Umar Saif, Roni Rosenfeld, *Rapid Collection of Spontaneous Speech Corpora using Telephonic Community Forums*. In Proceedings of INTERSPEECH 2018, Sep 2-6, Hyderabad, India.
- [15]. Haris Bin Zia, **Agha Ali Raza**, Awais Athar, *Urdu Word Segmentation using Conditional Random Fields*. In Proceedings of the 2018 International Conference on Computational Linguistics (COLING 2018), Aug 20-26, Santa Fe, New Mexico, USA.
- [16]. **Agha Ali Raza**, Bilal Saleem, Shan Randhawa, Zain Tariq, Awais Athar, Umar Saif, Roni Rosenfeld, *Baang: A Viral Speech-based Social Platform for Under-Connected Populations*. In CHI Conference on Human Factors in Computing Systems Proceedings (CHI 2018), April 21-26, Montréal, Canada.
- [17]. Haris Bin Zia, **Agha Ali Raza**, Awais Athar, *PronouncUR: An Urdu Pronunciation Lexicon Generator*. In 11th International Conference on Language Resources and Evaluation (LREC 2018), May 07-12, Miyazaki, Japan.
- [18]. Hira Ejaz, Syed Ali Hussain, **Agha Ali Raza**, *The Case for IVR-Based Citizen Journalism in Pakistan*, In Proceedings of the 20th International Conference on Human-Computer Interaction with Mobile Devices and Services (MobileHCI). Sept. 03-06, 2018, Barcelona, Spain.
- [19]. Waleed Riaz, Haris Durrani, Suleman Shahid, **Agha Ali Raza**, *ICT Intervention for Agriculture Development: Designing an IVR System for Farmers in Pakistan*. In Proceedings of the International Conference on Information and Communication Technologies and Development (ICTD 2017), Nov 16-19, 2017, Lahore, Pakistan.
- [20]. **Agha Ali Raza**, Samia Razaq, Amna Raja, Rizwan Naru, Ali Gibran, Abdullah Sabri, Haroon Niaz, Muhammad Bilal Saleem, Umar Saif, *Real-time Automated Surveys among Low-literate Masses using Voice-based Telephone Services*. In ACM DEV 2016, November 18-20, 2016, Nairobi, Kenya.
- [21]. **Agha Ali Raza**, Rajat Kulshreshtha, Spandana Gella, Sean Blagsvedt, Maya Chandrasekaran, Bhiksha Raj, Roni Rosenfeld, *Viral Spread via Entertainment and Voice Messaging Among Telephone Users in India*. In Proceedings of the International Conference on Information and Communication Technologies and Development (ICTD 2016), Jun 03-06, 2016, Ann Arbor, Michigan, USA.
- [22]. Nikolas Wolfe, Juneki Hong, **Agha Ali Raza**, Bhiksha Raj and Roni Rosenfeld, *Rapid Development of Public Health Education Systems in Low-Literacy Multilingual Environments: Combating Ebola Through Voice Messaging*, in SLaTE (Workshop on Speech and Language Technology in Education), Satellite Event of INTERSPEECH 2015, September 4-5, 2015, Leipzig, Germany.
- [23]. Yibin Lin, **Agha Ali Raza**, Jay-Yoon Lee, Danai Koutra, Roni Rosenfeld and Christos Faloutsos, *Influence Propagation: Patterns, Model and a CaseStudy*, in PAKDD2014, the 18th Pacific-Asia Conference on Knowledge Discovery and Data Mining, May 13-16, 2014, Tainan, Taiwan.
- [24]. Haohan Wang, **Agha Ali Raza**, Yibin Lin, and Roni Rosenfeld, *Behavior Analysis of Low-literate Users of a Viral Speech-based Telephone Service*, in Proceedings of the 4th Annual Symposium on Computing for Development, ACM DEV-4. December 6-7, 2013, Cape Town, South Africa.
- [25]. **(CHI Best Paper Award) Agha Ali Raza**, Farhan Ul Haq, Zain Tariq, Mansoor Pervaiz, Samia Razaq, Umar Saif and Roni Rosenfeld, *Job Opportunities through Entertainment: Virally Spread Speech-Based Services for Low-Literate Users*. In CHI Conference on Human Factors in Computing Systems Proceedings (CHI 2013). April 27-May 2, 2013, Paris, France.
- [26]. **Agha Ali Raza**, Farhan Ul Haq, Zain Tariq, Umar Saif, and Roni Rosenfeld, *Spread and Sustainability: The Geography and Economics of Speech-Based Services*. In Proceedings of ACM DEV, January 11-12, 2013, Bangalore, India.
- [27]. **Agha Ali Raza**, Mansoor Pervaiz, Christina Milo, Samia Razaq, Guy Alster, Jahanzeb Sherwani, Umar Saif, and Roni Rosenfeld. *Viral entertainment as a vehicle for disseminating speech-based services to low-literate users*. In Proceedings of the Fifth International Conference on Information and Communication Technologies and Development (ICTD 2012), March 12-15, 2012, Atlanta, Georgia, USA.
- [28]. **Agha Ali Raza**, Sarmad Hussain, Huda Sarfraz, Inam Ullah, Zahid Sarfraz, *An ASR System for Spontaneous Urdu Speech*, in the Oriental COCOSDA 2010 conference, Nov. 24-25, 2010, Katmandu, Nepal.
- [29]. Huda Sarfraz, Sarmad Hussain, Riffat Bokhari, **Agha Ali Raza**, Inam Ullah, Zahid Sarfraz, Sophia Pervez, Asad Mustafa, Iqra Javed, Rahila Parveen, *Speech Corpus Development for a Speaker Independent Spontaneous Urdu Speech Recognition System*, in the Oriental COCOSDA 2010 conference, Nov. 24-25, 2010, Katmandu, Nepal.
- [30]. Huda Sarfraz, Sarmad Hussain, Riffat Bokhari, **Agha Ali Raza**, Inam Ullah, Zahid Sarfraz, Sophia Pervez, Asad Mustafa, Iqra Javed, Rahila Parveen, *Large Vocabulary Continuous Speech Recognition for Urdu*, in International conference on the Frontiers of Information Technologies, December 21-23, 2010, Islamabad, Pakistan.
- [31]. **Agha Ali Raza**, Sarmad Hussain, Huda Sarfraz, Inam Ullah, Zahid Sarfraz, *Design and development of phonetically rich Urdu speech corpus*, Proceedings of O-COCOSDA'09 and IEEE Xplore; O-COCOSDA'09, 10-13 Aug 2009, School of Information Science and Engineering of Xinjiang University, Urumqi, China.

- [32]. **Agha Ali Raza**, Awais Athar, and Sajid Nadeem, *N-GRAM Based Authorship Attribution in Urdu Poetry*, Proceedings of the Conference on Language and Technology 2009 (CLT09), Lahore, Pakistan, Jan 2009.
- [33]. **Agha Ali Raza**, Zulfiqar Habib, Manabu Sakai, *Interpolation with rational cubic spirals*, Proceedings of the 4th IEEE International Conference on Emerging Technologies (IEEE Catalog No. CFP08617, ISBN: 978-1-4244-2211-1, Library of Congress: 2008901427), Rawalpindi, Pakistan, Oct. 2008.
- [34]. **Agha Ali Raza**, Asma Zaib, Sana Altaf, Zulfiqar Habib, *On a Special case of path planning*, Proceedings of the 7th CIIT Workshop on Research in Computing (ISBN: 978-969-8779-18-4), Lahore, Pakistan, June 2008.

Peer-reviewed Posters and Symposium Papers

- [1]. Sacha St-Onge Ahmad, Mustafa Naseem, Shan Randhawa, Muhammad Bilal Saleem, Agha Ali Raza, Tallal Ahmad, **Agha Ali Raza**, *Pilot of an Interactive Voice Response Service for Delivering Maternal Health Information to Expectant Fathers in Pakistan*. In International Social and Behavior Change Communication Summit (SBCC) 2020,
- [2]. Extended abstract: Ayesha Asghar, **Agha Ali Raza**, Maryam Mustafa. *Determining Socio-Economic status of Twitter users through their educational level, content they post and language*. In *HCI Across Borders Symposium* at CHI Conference on Human Factors in Computing Systems Proceedings (CHI 2019), May 4–9, 2019, Glasgow, Scotland UK.
- [3]. Hamid Mehmood, Lubna Razaq, Jennifer Webster, Amna Batool, Maryam Mustafa, **Agha Ali Raza**, Richard Anderson, *Save My Money: Digitizing Informal Savings in Pakistan*, In *HCI Across Borders Symposium* at Conference on Human Factors in Computing Systems. Apr 21-26, 2018, Montreal, Canada.
- [4]. Maryam Ayub, Sacha St-Onge Ahmad, Bilal Saleem, **Agha Ali Raza**, Mustafa Naseem, Jay Chen, *How to Advertise a Speech-Based Service to Offline Populations: A Case Study from Pakistan*, In *HCI Across Borders Symposium* at Conference on Human Factors in Computing Systems. Apr 21-26, 2018, Montreal, Canada.
- [5]. Sacha St-Onge Ahmad, Muhammad Bilal Saleem, Maryam Ayub, Tallal Ahmad, Shan Randhawa, Zain Tariq, Mustafa Naseem, **Agha Ali Raza**, *Usage and Feedback from a 3-Week Launch of a Maternal Health Line for Men in Pakistan*, In *HCI Across Borders Symposium* at Conference on Human Factors in Computing Systems. Apr 21-26, 2018, Montreal, Canada.
- [6]. Hira Ejaz, Syed Ali Hussain, **Agha Ali Raza**, *IVR-Based Citizen Journalism in Pakistan*, In *HCI Across Borders Symposium at Conference on Human Factors in Computing Systems*. Apr 21-26, 2018, Montreal, Canada.
- [7]. Sacha St-Onge Ahmad, Mustafa Naseem, **Agha Ali Raza**, *Maternal Awareness for Low-Literate Expecting Parents via Voice-Based Telephone Services*, In *HCI Across Borders Symposium* at Conference on Human Factors in Computing Systems. May 06-11, 2017, Denver, CO, USA.
- [8]. Abdullah Kharal, Mustafa Naseem, Sacha St-Onge Ahmad, **Agha Ali Raza**, *Sustainable IVR-Based Social Media for the Developing World*, In *HCI Across Borders Symposium* at Conference on Human Factors in Computing Systems. May 06-11, 2017, Denver, CO, USA.
- [9]. Aditya Vashistha, **Agha Ali Raza**, Umar Saif, Roni Rosenfeld, Richard Anderson, *Changing Perceptions of Citizens of India and Pakistan*. In Development Consortium: *HCI Across Borders* at Conference on Human Factors in Computing Systems. May 07-12, 2016, San Jose, USA.

Thesis and Dissertation

- [1]. Agha Ali Raza, *Viral Entertainment as a Vehicle for Disseminating Core Development Services*, Ph.D. Dissertation, Carnegie Mellon University, May 2015.
- [2]. Agha Ali Raza, *Design and Development of an Automatic Speech Recognition System for Urdu*, Masters Thesis, National University of Computer and Emerging Sciences, Lahore, June 2009.

Teaching Experience

Primary Course Instructor

- *Speech Processing* (CS+EE, Grad + Ugrad) at LUMS, Spring, 2021 (available online: <https://www.c-salt.org/courses/speech-processing-s2021>).
- *Machine Learning* (CS+EE, Grad + Ugrad) at LUMS, Spring, Fall 2020 (available online: <https://www.c-salt.org/courses/machine-learning-f2020>).
- *Fundamentals of Computer Systems* (Ugrad) at LUMS, Fall 2020
- Designed the course of *Natural Language Processing* (Grad + Ugrad) at ITU and have taught it annually 2016-19
- Designed the course of *Speech Processing* (Grad + Ugrad) at ITU and have taught it annually 2016-19
- Have taught *Data Structures & Algorithms* (Undergrad) at ITU and FAST-NUCES since 2006
- Have taught *Computer Organization & Assembly Language* (Undergrad) at ITU and FAST-NUCES since 2006
- Have taught *Computer Architecture* (Undergrad) and *Advanced Computer Architecture* (Grad) at FAST-NUCES (FCEs (student evaluations) consistently and significantly exceed departments' norms.)

Lab Instructor

- Embedded Systems – FAST NUCES
- Microprocessor Interfacing and Programming – FAST NUCES
- Computer Organization & Architecture – FAST NUCES
- Computer Logic & Design – FAST NUCES

(Also designed the lab manuals for the above-mentioned lab courses)

Honors and Awards

- Fulbright 2010 Doctoral scholarship
- ACM CHI 2020 Honorable Mention Award
- ACM CHI 2013 Best Paper Award
- Highest CGPA of 3.96 in Master of Computer Science at NUCES FAST

Professional Services

- *Associate Chair* for the "Specific Application Areas" subcommittee of the Program Committee for CHI 2021-22
- *Reviewer* for ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW) 2020
- *Associate Chair* for the "Specific Application Areas" subcommittee of the Program Committee for CHI 2019
- *Technical Program Committee* (papers) member for ICTD2016-20
- *Technical Program Committee* (papers) member for COMPASS 2018-20
- *Scientific Committee* member for the 12th International Conference on Language Resources and Evaluation (LREC) 2020
- *Program Committee Chair* for Short Papers (Notes) for ICTD 2017
- *Reviewer* for Transactions on Asian and Low-Resource Language Information Processing (TALLIP)
- *Reviewer* for ACM User Interface Software and Technology (UIST) 2019 conference
- *Reviewer* for ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW) 2019
- *Reviewer* for CHI 2015 – 2018
- *Reviewer* for DIS 2019
- *Reviewer* for CSCW 2019
- *Reviewer* for UIST 2019
- *Technical Program Committee* (papers and posters) member for ACM DEV2015-16
- Organized ICTD 2017 in Pakistan at ITU, Lahore. ICTD is the flagship conference in the domain of Information and Communication Technologies for Development
- Member of *Board of Studies* of Department of Applied Linguistics at Kinnaird College for Women University
- *External Evaluator* for MPhil theses in Applied Linguistics at Kinnaird College for Women University (2018-19)
- *Publication Chair* and *Technical Program Committee* member for CLT2016
- Faculty Advisor to the SOFTEC student society of FAST-NU. Supervised the SOFTEC 2008 and 2009 events. SOFTEC (SOFTware Exhibition & Competition) is the largest student-arranged IT extravaganza in Pakistan
- Faculty Co-Advisor to the Interface society of FAST-NU, which publishes the annual university magazine
- Faculty Advisor to the DRAM@F society (dramatic society) of FAST-NU. The society arranged the annual drama festival 2008 under my supervision
- Faculty Advisor to the CREATIVE society of FAST-NU, which arranges academic and recreational student events

University Services

- Member of Student Activities, Outreach, and Alumni Committee, LUMS – (2020)
- Member of Graduate Admission Committee, LUMS – (2020)
- Director of ORIC at ITU – (2019)
- Member of the undergraduate curriculum committee – (2016 - 2019)
- Vice-president of the ACM SIGCHI Lahore Chapter – (2017 - now)
- Founder and Director, Center for Speech and Language Technologies (CSaLT) – (2015 - now)
- Established UNESCO Chair for ICT4D at ITU in 2018 (with Umar Saif and Amna Raja)

Talks and Guest Lectures

- **Jun 25, 2021:** Guest lecture on "The internet of the Orals" at the University of Maryland in the class of "Global Health Messages: Understanding Exposure and Impact" taught by Sacha Ahmad. (YouTube link).
- **Jun 28, 2021:** Conducted a 3hr workshop on "Machine Learning: Discriminative Models" in collaboration with ADDO AI.
- **Feb 26, 2021:** Expert Interview on "Digital Literacy" at Google Inc.
- **May 24, 2021:** Conducted a 3hr workshop on "Machine Learning: Generative Models" in collaboration with ADDO AI.
- **Apr 12, 2021:** Guest speaker in the panel (of two) discussion in Dr. Fahad Dogar's class on "Computing for Developing Regions" at Tufts University, USA.
- **Mar 31, 2021:** Guest Lecture on "The internet of the Orals" in the ICTD class Dr. Jay Chen at the University of California, Berkeley.
- **Mar 18, 2021:** Guest Lecture on "The internet of the Orals" in the HCI class Dr. Dipanjan Chakraborty at the Birla Institute of Technology and Science, Pilani (BITS Pilani), Hyderabad Campus.
- **Jul 09, 2020:** Invited talk on Machine Learning, Artificial Intelligence and Robotics, at Standard Chartered Bank, Pakistan. The talk was attended by 97 participants from SCB.

- **Jul 01, 2020:** Invited talk on Viral Spread of COVID-19 Information using an IVR Social Platform, at Google, Mountain View, CA, USA. The talk was attended remotely by 50 participants from various Google teams around the world.
- **Mar 06, 2020:** Invited talk on *Speech over simple phones: The internet of the Orals*, at the DICE-IET 2020 conference at the COMSATS University, Lahore.
- **Jan 27, 28, 2020:** Invited panel discussion in the class of Human-Computer Interaction (HCI) at the University of Michigan, Ann Arbor, USA.
- **Nov 17, 2019:** Invited keynote address on *Speech over simple phones: The internet of the Orals*, at the ICICT 2019 conference at the Institute of Business Management (IBA), Karachi.
- **May 10, 2019:** Invited talk on *Speech over simple phones: The internet of the Orals*, at the School of Mathematical and Computer Sciences of Heriot Watt University, Edinburgh, Scotland, UK.
- **Apr 21, 2019:** Invited colloquium talk on *Speech over simple phones: The internet of the Orals*, at the Computer Science Department of New York University, Abu Dhabi (NYU-AD).
- **Apr 18, 2019:** Invited guest lecture on *Speech over simple phones: The internet of the Orals*, at the Computer Science Department of Lahore University of Management Sciences (LUMS).
- **Apr 14, 2019:** Invited seminar lecture on *Speech over simple phones: The internet of the Orals*, at the Computer Science Department of Carnegie Mellon University, Qatar (CMU-Q).
- **Feb 25, 2019:** Guest Lecture on *Viral Entertainment as a Vehicle for Disseminating Development Services*, to the Human-Computer Interfacing class at Lahore University of Management Sciences (LUMS).
- **Jun 29, 2018:** Invited talk at UNESCO Chair in Technologies for Development: Voices of the Global South, EPFL-Tech4Dev on *Speech-based Telephone Services for Development*.
- **Apr 24, 2018:** Paper presentation at CHI 2018 on *Baang: A Viral Speech-based Social Platform for Under-Connected Populations*.
- **Dec 18, 2017:** Guest lecture on *Speech and Natural Language Processing: An Introduction*, at University of Management and Technology, Lahore for BS CS students of Artificial Intelligence and Machine Learning courses.
- **Nov 18, 2017:** Panelist on a panel discussion on Urdu Language and Information Technology, at *Faiz International Festival*, Lahore. Other panelists included Dr. Sarmad Hussain, Mr. Musharaf Ali Farouqi and Prof. Kamran Malik. The panel was moderated by Dr. Umar Saif.
- **Jan 08, 2017:** Keynote talk on the use of *Speech-based Social Media to provide social connectivity among low-literate and visually impaired masses*, at Assistive Communication Technology Event by Riphah International University.
- **Nov 17, 2016:** Invited talk on Speech-based Social Media at the 6th International Conference on Language & Technology (CLT'16), UET, Lahore.
- **Oct 28, 2016:** Guest Lecture on *Morphological Parsing and Stemming* at Kinnaird College for Women for BS and MPhil students of Applied Linguistics.
- **Jun 04, 2016:** Paper presentation at ICTD 2016 on *Viral Spread via Entertainment and Voice-Messaging Among Telephone Users in India*
- **May 12, 2016:** Invited talk at Google and Youtube, Mountain View, CA, USA on *Virality of mobile-based, speech services and dissemination of development-related information to low-literate masses*.
- **Apr 29, 2016:** Invited talk on *ICT4D and research opportunities at ITU*, at FAST National University, Lahore, Pakistan.
- **Feb 03, 2016:** Remote guest lecture on *Viral Entertainment as a Vehicle for Disseminating Development Services* delivered to the faculty of College of Aeronautical Engineering (NUST), Risalpur, Pakistan.
- **Nov 23, 2015:** Guest Lecture on *Viral Entertainment as a Vehicle for Disseminating Development Services*, to the undergraduate Human-Computer Interfacing class at Lahore University of Management Sciences (LUMS).
- **Oct 27, 2015:** Invited talk on *Multi-Modal Interfaces and Channels for Access of Local Language Content* at the Workshop on Facilitating Local Language Content Access and Generation using Human Language Technologies at KICS, UET arranged by Center for Language Engineering (CLE).

Research Collaborators

- Prof. Roni Rosenfeld, Carnegie Mellon University, Pittsburgh, PA, USA
- Prof. Richard Anderson, University of Washington, Seattle, USA
- Prof. Kentaro Toyama, University of Michigan, Ann Arbor, USA
- Prof. Jay Chen, New York University, Abu Dhabi
- Prof. Melissa Densmore, University of Cape Town, South Africa
- Prof. Arman Razaee, University of California, Davis, USA
- Prof. Sarojini Hirshleifer, University of California, Riverside, USA
- Prof. Mustafa Naseem, University of Michigan, Ann Arbor, USA
- Prof. Aditya Vashistha, Cornell University, Ithaca, USA
- Prof. Lakshmi Subramanian, New York University, New York, USA
- Prof. Kurtis Heimerl, University of Washington, Seattle, USA

- Prof. Saeed Ul Hasan, Information Technology University (ITU), Lahore, Pakistan
- Prof. Faisal Kamiran, Information Technology University (ITU), Lahore, Pakistan
- Prof. Mudassir Shabbir, Information Technology University (ITU), Lahore, Pakistan
- Prof. Syed Ali Hussain, Arizona State University, USA
- Nithya Sambasivan and Garen Checkley, Google Inc.
- Awais Athar, European Bioinformatics Institute (EMBL-EBI), Cambridge, UK

MS and Ph.D. Thesis Supervision

- [1]. Hafiz Rizwan Iqbal, Ph.D. CS, 2017-2021, *Use of Interactive Voice-based Stories for Information Dissemination and Behavioral Change*
- [2]. Muhammad Hamid, MSCS, 2017-2019, *Topic identification in speech without ASR*
- [3]. Rashad Maqsood, MSCS, 2017-2019, *Urdu Plagiarism Detection*
- [4]. Asad Mustafa Khan, MSCS, 2017-2019, *Urdu Plagiarism Detection*
- [5]. Asma Mushtaq, MSCS, 2017-2019, *Crime News Analysis*
- [6]. Aamina Batool, MSCS, 2017-2019, *Speech emotion detection*
- [7]. Namooos Hayat Qasmi, MSCS, 2017-2019, *Urdu text simplification*
- [8]. Jawad Arshad, MSCS, 2017-2019, *Pronunciation verification using anomaly detection*
- [9]. Faisal Rehman, MSCS, 2017-2019, *Grade prediction using semester performance and demographics.*
- [10]. Amna Dilawar, MSCS, 2016-2018, *Sentiment Analysis for Roman Urdu*
- [11]. Syed Ali Abbas, MSCS, 2016-2018, *Autonomous control for UAVs*
- [12]. Samra Mubeen, MSCS, 2016-2018, *Multi-speaker phonetically rich Urdu speech corpus using natural sentences*
- [13]. Haris Bin Zia, MSCS, 2016-2018, *Multispeaker speech recognition for Urdu*
- [14]. Farhan Ahmad, MSCS, 2016-2018, *Speech recognition of Quranic recitation*
- [15]. Ghulam Mujtaba, MSCS, 2015-2017, *Influence of phonetic overlap on use of SALAAM for local language recognition*
- [16]. Saad Bin Zahid, MSCS, 2015-2017, *Keyword spotting for Urdu*
- [17]. Sana Saeed Khan, MSCS, 2015-2017, *Influence of phonetic overlap between the source and target languages using SALAAM for Urdu speech recognition*
- [18]. Muneeb Sajjad, MSCS, 2014-2016, *Urdu alphabet teacher for kids*
- [19]. Co-advised: Aisha Anjum, MSCS, *Automatic acoustic environment classification*
- [20]. Co-advised: Waleed Riaz, MSCS, *IVR services to provide information access to farmers*
- [21]. Co-advised: Afsheen Ali, MSCS, *Vision, and sentiments*

Biography

I am an Assistant Professor in the Department of Computer Sciences, Syed Babar Ali School of Science and Engineering (SBASSE), *Lahore University of Management Sciences* (LUMS) and also the founding director of the *Center for Speech and Language Technologies*. I am a Fulbright Scholar and received my Ph.D. from the Language Technologies Institute, School of Computer Science at *Carnegie Mellon University*, Pittsburgh, USA. I received my Master of Computer Science and Bachelor of Computer Science degrees from *FAST - National University*, Lahore. My cumulative teaching experience as part of the Computer Science faculty at FAST-NU and ITU spans ten years. I teach Computer Science courses at the graduate and undergraduate levels including Natural Language Processing, Speech Processing, Machine Learning, Data Structures and Algorithms, Assembly Language Programming, Digital Logic Design and Computer Architecture.

My research interests include Speech and Natural Language Processing, Speech-based Human-Computer Interfaces, telephone-based automated dialog systems, and Information & Communication Technologies for Development (ICT4D). The aim of my research is to enable dissemination of speech-based, development-related information and communication services to under-connected populations (low-literate, poor, tech-novice, visually impaired, marginalized) throughout the developing world. My work shows that speech-based entertainment services and social networks accessible over simple and feature mobile phones can be used as powerful motivators to induce self-training and viral spread among low-literate masses. Such services can further be used as vehicles for delivering core development services to disseminate development-related information, gather information in the form of real-time surveys and to perform randomized controlled trials and demographic studies. Such services also provide under-connected populations with a voice and a social identity. I have authored/co-authored 28 research papers published in peer-reviewed conferences. Over the last three years, the benefits of my research have directly impacted the lives of more than 250,000 people via various projects in Pakistan (Polly, Job-Audio Portal, Hello-Rozgar, Baang, COVID-19 Social HealthLine, Sawaal, Super Abbu and Rah-e-Maa), India (Polly in collaboration with Babajob.com and Jharkhand Mobile Vaani) and West Africa (Polly-Message, Ebola-HealthLine). My novel approach to mass-disseminate information about job-opportunities to low-literate telephone users in Pakistan received the 2013 best paper award at the prestigious ACM CHI conference on Human-Computer Interfaces.

My research has been funded by prestigious organizations like Google (Technology and Gender Disparity, as PI), UNICEF (USD100,000, Rah e Maa: IVR services to disseminate birth preparedness awareness to expecting fathers, as PI), GIZ (1 Million Euros, Hello Rozgar: Improving Access To Skills Training And Employment Opportunities For Marginalized People Using An Interactive Voice Response System, as Technical Lead), National Institutes of Health (NIH) (USD 250,000, Impact evaluation of Super Abbu: A speech-based MNCH platform in Pakistan, as co-PI), the National Academies of Sciences, Engineering, Medicine, Keck Futures Initiative (USD 500,000, Digital Street Theater for Global Maternal and Child Health Education, as co-PI), and Higher Education Commission of Pakistan (Speech Forensics, National Center of Excellence in Big Data and Cloud Computing, as co-PI). I am currently an Associate Chair for CHI. I have also been the program committee chair for short papers for ICTD 2017 and a program committee member for CHI, ICTD, and ACM COMPASS (formerly ACM DEV) for since 2015.