Asif Salekin

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EXPERIENCE

SYRACUSE UNIVERSITY | Tenure Track Assistant Professor
Department of Electrical Engineering and Computer Science
August 2019 - Now | Syracuse, New York, USA.

SUNY Upstate Medical University | Voluntary Faculty Assistant Professor
Department of Psychiatry
May 2020 - Now | Syracuse, New York, USA.

NOKIA BELL LABS | Research Intern
BHAG Realization Lab
June 2018 - Aug 2018 | Murray hill, New Jersey, USA.

BOSCH RESEARCH AND TECHNOLOGY CENTER | Research Intern
Human-Machine Interaction Lab | Audio Analytics and Deep Learning
May 2017 - Oct 2017 | Palo Alto, California, USA.

EDUCATION

UNIVERSITY OF VIRGINIA | PhD in Computer Science
Advisor: Professor John A. Stankovic | July 2019

UNIVERSITY OF VIRGINIA | Masters of Computer Science (MCS)
May 2016

BANGLADESH UNIV. of ENGG. & TECH. | BSc in Computer Science & Engineering
May 2012

RESEARCH INTERESTS

Human-Centered Computing, Ubiquitous Computing, Cyber Physical Systems (CPS), Mobile Health, Machine Learning, and Sensing Security and Privacy.

FUNDING AND GRANTS

1. **Title: Collaborative Research: SCH: Psychophysiological Sensing to Enhance Mindfulness-Based Interventions for Self-Regulation of Opioid Cravings**
   Supporting agency: National Science Foundation (NSF) Medium
   PI: **Asif Salekin** (Lead PI)
   Co-PI: Dessa Bergen-Cico
   Total budget amount (Syracuse University): $756,356
   Asif Salekin budget: $451,000
   Performance period: 2022-2025
   This project focuses on developing and testing innovative technologies to aid sustainable recovery of opioid use disorders by in-home craving and psychological cues monitoring and generation of adaptive, personalized, and just-in-time mindfulness-based interventions (MBIs).

2. **Title: CPS: Small: Developing a Socio-Psychological CPS for the Health and Wellness of Dairy Cows.**
   Supporting agency: National Science Foundation (NSF) Small
   PI: Sucheta Soundarajan
   Co-PI: **Asif Salekin**
   Total budget amount (Syracuse University): $500,000
   Asif Salekin: 40% , Two PIs 40%-40%, addition 20% consultants
   Performance period: 2022-2025
   This project focuses on building a cyber-physical system that integrates the social interactions of dairy cattle with other biometric data, develop predictive models that use such data to perform early identification of sick or vulnerable cattle, and creates algorithms to provide adaptive interventions to cattle farmers.

3. **Title: Intensive Speech Motor Chaining Treatment and Artificial Intelligence Integration for Residual Speech Sound Disorders** (most recent)
   Supporting agency: NIH R01: NIDCD Low Risk Clinical Trials in Communication Disorders
   Award Document # RDC020959A
   Status: Reviewed 9 percentile, getting recommended.
   PI: Jonathan L Preston
   Co-investigator: **Asif Salekin**
   Asif Salekin budget: $304,000
   Performance period: 2023-2027
   Speech sound disorder (SSD) is the most common communication impairment treated by speech-language pathologists (SLPs). About 25% of preschoolers with SSD retains misarticulations as adolescents on /r, s, z/ due to ineffective treatment or barriers limiting access to SLPs. The project aims to develop automated motor-based assessment and treatment for residual SSD (RSSD).

4. **Title: The influence of contextual and constitutional emotional processes on speech motor control and speech motor learning in early childhood stuttering, Inst. no. SP-31861-2**
   Supporting agency: 1R21DC018103-01A, National Institute on Deafness & Other Communication Disorders/NIH/DHHS
   PI: Victoria Tumanova
   Co-investigator: **Asif Salekin**
   Total Direct Costs (Syracuse University): $275,000
   Performance period: 03/2021-02/2023
   This project aims to advance the understanding of stuttering development in preschool-age children and inform future fluency treatment. Specifically, the researchers are interested in how different aspects of emotional reactivity influence children's speech-motor control and speech-motor learning.

5. **Title: Biofeedback-Enhanced Treatment for Speech Sound Disorder: Randomized Controlled Trial and Delineation of Sensorimotor Subtypes.**
   Supporting agency: NIH R-01, 2021 - The Artificial Intelligence/Machine Learning administrative supplement award.
   Co-investigator: **Asif Salekin**
   Total Direct Costs (Syracuse University): $100,000
   Performance period: 08/2021-07/2022
   The project aims to develop an automated speech-to-text transcription approach accessible to individuals with speech disfluency/disorder. Additionally, generate a benchmark public dataset on speech disfluency to facilitate AI approach development in this domain.

6. **Title: Developing a Clinical Speech Recognition System for Childhood Speech Disorders**
   Supporting agency: Syracuse University Collaboration for Unprecedented Success and Excellence (CUSE)
   PI: Jonathan L Preston
   Co-PI: **Asif Salekin**
   Total Direct Costs: $22,000
   Project Period: 2021-2023
   The project aims to develop an automated software platform for accurate classification and feedback on children's articulation errors. It has high significance and impact for potentially improving the ability to effectively improve a speech sound error (/r/) that is challenging to remediate.

AWARDS

IAAI Deployed Application Award , The Thirty-Third Annual Conference on Innovative Applications of Artificial Intelligence (IAAI-21).

Graduate Student Award for Outstanding Research , UVA Department of Computer Science, 2018

Nominated for best paper award , (AsthmaGuide) at Wireless health, 2016

Selected for Third Annual Public Days Showcase Event
The Public Days showcase highlights exemplary scholarship, research, and creative work of the University's undergraduate and graduate students, as well as post-docs. Our project, AsthmaGuide, was selected to represent the highest achievements of scholarship, research, and creative work from undergraduate and graduate students across Grounds.

Student Travel Award : SenSys Student Grant, NSF, 2015, and Wireless Health Travel Grant, NIH, 2014

PEER REVIEWED FULL PAPERS | PUBLISHED/ACCEPTED

J Journal, C Conference, W Workshop.

(J+C) **Psychophysiological Arousal in Young Children Who Stutter: An Interpretable AI Approach**
Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies **(IMWUT)** , 2022. **(Ubicomp 2022)**
(csrankings listed leading conference, acceptance rate not public, avg. between 20-25%)
Harshit Sharma, Yi Xiao, Victoria Tumanova, **Asif Salekin**
* Asif Salekin is the corresponding author.

(J+C) **Combating False Data Injection Attacks on Human-Centric Sensing Applications**
Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies **(IMWUT)** , 2022. **(Ubicomp 2022)**
(csrankings listed leading conference, acceptance rate not public, avg. between 20-25%)
Jingyu Xin, Vir V. Phoha, **Asif Salekin**
* Asif Salekin is the corresponding author.

(J) **Evaluation of individual and ensemble probabilistic forecasts of COVID-19 mortality in the US**
The Proceedings of the National Academy of Sciences USA **(PNAS)** , 2022.
(One of the most prestigious general-science journals. Impact factor 12.78.)
Cramer et al. (Asif Salekin is one of the authors)

(C) **PERCEPT-R: An Open-Access American English Child/Clinical Speech Corpus Specialized for the Audio Classification of /ɹ/**
Proc. Interspeech 2022. (acceptance rate 50%)
Nina Benway, Jonathan L. Preston, Elaine Hitchcock, **Asif Salekin** , Harshit Sharma and Tara McAllister

(J) **Genomic Machine Learning Meta-regression: Insights on Associations of Study Features with Reported Model Performance**
Proc. Oxford **Bioinformatics** , 2022 (in minor revision stage), Leading journal of bioinformatics with impact factor 6.937.
Eric Barnett, Daniel G Onete, **Asif Salekin** , Stephen V Faraone

(C) **Hyperspectral Image Super-Resolution in Arbitrary Input-Output Band Settings**
In Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (pp. 749-759), 2022. (acceptance rate 43%)
Zhang, Z., Xu, Z., Ahmed, Z., **Salekin, A.** , Rahman, T.

(J) **Emotion Recognition Robust to Indoor Environmental Distortions and Non-targeted Emotions Using Out-Of-Distribution Detection.**
ACM Transactions on Computing for Healthcare, 2021.
Y. Gao, **A. Salekin** , K. Gordon, K. Rose, H. Wang, J. Stankovic

(C) **Preclinical Stage Alzheimer's Disease Detection Using Magnetic Resonance Image Scans**
The Thirty-Third Annual Conference on Innovative Applications of Artificial Intelligence **(IAAI-21)** .
(csrankings listed leading conference, acceptance rate 21%)
Fatih Altay, Guillermo Ramón Sánchez, Yanli James, Stephen V. Faraone, Senem Velipasalar, **Asif Salekin** .
* Asif Salekin is the corresponding author.

(W) **Understanding autism: the power of EEG harnessed by prototypical learning.**
Proceedings of the Workshop on Medical Cyber Physical Systems and Internet of Medical Things. 2021. (Acceptance rate 40% approx.)
Asif Salekin and Natalie Russo.
* Asif Salekin is the corresponding author.

(W) **HirePreter: A Framework for Providing Fine-grained Interpretation for Automated Job Interview Analysis**
In 2021 9th International Conference on Affective Computing and Intelligent Interaction Workshops (ACIIW). IEEE.
(Acceptance rate 45% approx.)
Wasifur Rahman, Sazan Mahbub, **Asif Salekin** , Md Kamrul Hasan and Ehsan Hoque.

(C) **Exploring Inherent Sensor Redundancy for Automotive Anomaly Detection**
The 57th Design Automation Conference **(DAC 2020)** .
(csrankings listed leading conference, acceptance rate 23.2%)
Tianjia He, Lin Zhang, Fanxin Kong, and **Asif Salekin** .
* Asif Salekin is the corresponding author.

(C) **A Real-Time Audio Monitoring Framework with Limited Data for Constrained Devices**
The 15th International Conference on Distributed Computing in Sensor Systems (DCOSS 2019). (acceptance rate 25%)
A. Salekin , S. Ghaffarzadegan, Z. Feng, and J. Stankovic
* Asif Salekin is the first author.

(C) **ARASID: Artificial Reverberation-Adjusted Indoor Speaker Identification Dealing with Variable Distances**
International Conference on Embedded Wireless Systems and Networks **(EWSN), 2019.**
(A+ Core Rank Conference, acceptance rate not public, avg. between 20-25%)
Z. Chen, M. Ahmed, **A. Salekin** , J. Stankovic

(J+C) **A Weakly Supervised Learning Framework For Detecting Social Anxiety And Depression**
ACM Interactive, Mobile, Wearable, and Ubiquitous Technologies **(IMWUT)** , Vol. 2, Issue. 2 **(Ubicomp 2018)** .
(csrankings listed leading conference, acceptance rate 19%)
A. Salekin , J. Eberle, J. Glenn, B. Teachman, J. Stankovic
* Asif Salekin is the first author.

(J+C) **Distant Emotion Recognition**
ACM Interactive, Mobile, Wearable, and Ubiquitous Technologies **(IMWUT)** , Vol. 1, Issue. 3 **(Ubicomp 2017)** .
(csrankings listed leading conference, acceptance rate 21%)
A. Salekin , Z. Chen, M. Ahmed, J. Lach, D. Spruijt-Metz, K. Haye, B. Bell, J. Stankovic
* Asif Salekin is the first author.

(C) **DAVE: Detecting Agitated Vocal Events**
IEEE/ACM Conference on Connected Health: Applications, Systems and Engineering technologies (CHASE), 2017.
(acceptance rate 26%)
A. Salekin , H. Wang, K. Williams, J. Stankovic
* Asif Salekin is the first author.

(C) **AsthmaGuide: An Asthma Monitoring and Advice Ecosystem**
IEEE Wireless Health 2016. **(Nominated for best paper)** (acceptance rate not public)
Co-first authors (**A. Salekin** , H. Ra), H. Yoon, J. Kim, S. Nirjon, D. Stone, S. Kim, J. Lee, S. Son and J. Stankovic
* Asif Salekin one of the first authors.

(C) **Detection of Chronic Kidney Disease and Selecting Important Predictive Attributes**
IEEE International Conference on Healthcare Informatics (ICHI), 2016. (acceptance rate 24%)
A. Salekin , J. Stankovic
* Asif Salekin is the first author.

(C) **MOBI-COG: A Mobile Application for Instant Screening of Dementia Using the Mini-Cog Test**
Wireless Health 2014. (acceptance rate not public)
S. Nirjon, I. Emi, A. Mondol, **A. Salekin** , and J. Stankovic

(C) **Extracting and Ranking Web Communities**
International Conference on Web Intelligence, Mining and Semantics (WIMS), 2013.
A. Salekin , J. Tabassum, M. Hasan
* Asif Salekin is the first author.

(C) **A Novel Approach for Constructing Emulator for Microsoft Kinect XBOX 360 Sensor in the .NET Platform**
International Conference on Intelligent Systems, Modelling and Simulation (ISMS), 2013.
MD. Rahman, S. Rahman, R. Hasan, R. Noel, **A. Salekin** , H. Ferdous

(C) **A Novel Clustering-Based Ensemble Classification Model for Block Learning**
International Conference on Pattern Recognition Applications and Methods (ICPRAM), 2013.
MD. Rahman, MD. Rahman, **A. Salekin** , S.H. Chowdhury, S.A. Anik

(C) **A Novel Approach for Generating Clustered Based Ensemble of Classifiers**
International Journal of Machine Learning and Computing, Vol. 3, Issue. 1, Page 137, 2013.
MD. Rahman, MD. Rahman, **A. Salekin** , A.S. Andalib

(C) **Composite Pattern Matching in Time Series**
International Conference on Computer and Information Technology (ICCIT), 2012.
A. Salekin , M. Islam, MD. Rahman

* Asif Salekin is the first author.

(C) **Pattern matching in time series using combination of neural network and rule based approach**
International Conference on Electrical and Computer Engineering (ICECE), 2012.
A. Salekin , MD. Rahman
* Asif Salekin is the first author.

(C) **Novel approaches for detecting fabric fault using artificial neural network with k-fold validation**
International Conference on Computer and Information Technology (ICCIT), 2012.
A.S. Andalib, **A. Salekin** , M.R. Islam, M. Abdulla-Al-Shami

PEER REVIEWED FULL PAPERS | UNDER-SUBMISSION

J Journal, **C** Conference, **W** Workshop.

(J+C) **Psychophysiology-aided Perceptually Fluent Speech Analysis of Children Who Stutter.**
Yi Xiao, Harshit Sharma, Victoria Tumanova, and Asif Salekin.
The Paper is under review in IMWUT/Ubicomp 2023
Preprint-arXiv & DOI:https://doi.org/10.48550/arXiv.2211.09089
* Asif Salekin is the corresponding author.

(J+C) **Privacy against Real-Time Speech Emotion Detection via Acoustic Adversarial Evasion of Machine Learning.**
Brian Testa, Yi Xiao, Avery Gump, and Asif Salekin
The Paper is under review in IMWUT/Ubicomp 2023
Preprint-arXiv & DOI:https://doi.org/10.48550/arXiv.2211.09273
* Asif Salekin is the corresponding author.

(C) **SparseVLR: A Novel Framework for Verified Locally Robust Sparse Neural Networks Search.**
Sawinder Kaur and Asif Salekin
The Paper is under review in CVPR 2023
Preprint-arXiv & DOI:https://doi.org/10.48550/arXiv.2211.09945
* Asif Salekin is the corresponding author.

(J) **Signal from Noise: Using Machine Learning to Distil Knowledge from Data in Biological Psychiatry.**
Quinn et al.
The Paper is under review in Nature Molecular Psychiatry (Impact factor 13.43)
Status: Going through the second cycle of revision
Preprint & DOI:https://doi.org/10.31234/osf.io/dz7gt
(Asif Salekin is one of the co/contributing authors)

PATENT

System And Method For Audio Event Detection In Surveillance Systems
A. Salekin , S. Ghaffarzadegan, Z. Feng (2019)
U.S. Patent Application No. 16/976,462.
Link: https://patents.google.com/patent/US20210005067A1/en

MENTORING EXPERIENCE

Supervising **six** Doctoral Students.

Supervised **five** Master's Students in research.

Supervising **two** undergrad students in research.

Undergraduate student advisor for **27** undergraduate students.

Hosted and supervised **one** K-12 student in the summer of 2022.
I partnered with the STEP program at Syracuse University to host underrepresented K-12 students each summer.

TEACHING EXPERIENCE

Instructor Course: Graduate Level Design and Analysis of Algorithm (CIS 675)
Fall 2022 (170 Students)
Fall 2021 (75 Students): Student Feedback: 4.25/5.
Fall 2020 (32 Students): Student Feedback: 4.14/5.
Fall 2019 (128 Students): Student Feedback: 3.89/5.

Instructor Course: Undergrad Level Design and Analysis of Algorithm (CIS 477)
Spring 2022 (30 Students): Student Feedback: 4.68/5.

Instructor Course: Instructor: Ubiquitous Computing (CIS 700)
Spring 2022 (11 Students): Student Feedback: 4.65/5.
Spring 2021 (12 Students): Student Feedback: 4.5/5.

Instructor Course: Machine Learning for IoT Applications (CIS 700)
Spring 2020 (10 Students): Student Feedback: 4.24/5.

Instructor Course: ML Nanocourse series, 2020.
Lectures on Machine Learning for Health.
SUNY Upstate Medical University

Invited lecturer: Two lectures on Machine Learning for IoT and CPS
Course: The Internet of Trillions of Things (Graduate level), UVA, Fall 2018

Invited lecturer: A lecture on Smart Connected Health
Course: Wireless Sensor Networks (Undergraduate level), UVA, Fall 2014

Graduate Teaching Assistant Course: Algorithm
UVA, Fall, 2013 and Spring, 2014
Hold office hours and graded homework and exams for over 300 students

SELECTED TALKS

Invited Talk: 'Understanding Autism: The Power of EEG Harnessed by Prototypical Learning'
Medical Cyber Physical Systems and Internet of Medical Things Workshop, 2021.

Invited Talk: 'Ubiquitous and human-centric computing in healthcare'
Research Exposure in Socially Relevant Computing (RESORC), Organized by Syracuse University in partnership with Google, 2021.

Invited Lecture: 'Adaptive Machine Learning for Human-Centric IoT Applications'
IEEE Syracuse Section
Engineering in Medicine and Biology Society Chapter Event, 2020

Invited Talk: 'Machine Learning for Constrained Devices with Limited Training Data'
University of Rochester, 2019

Invited Talk: 'Adaptive Machine Learning for IoT'
Indiana University, Bloomington, 2019

Invited Talk: 'Adaptive Machine Learning for IoT'
Florida State University, 2019

Workshop Presentation: 'Machine Learning for Constrained Devices with Limited Training Data'
International Workshop on NEXT-GENERATION CYBER-PHYSICAL SYSTEMS, 2018

Invited talk 'Human Machine Interaction', **BR Lab, Nokia Bell Labs** , NJ, USA, 2018

Invited talk 'Machine Learning for IOT and CPS', **ENSA Lab, Nokia Bell Labs** , NJ, USA, 2018

Full Paper Presentation ' Distant Emotion Recognition', **Ubicomp** , 2017

Full Paper Presentation 'Detecting Agitated Vocal Events', IEEE CHASE, July 2017

Invited talk 'Novel Feature Modeling for Audio Analytics', **BOSCH Research and Technology Center** , CA, USA, 2017

Poster Presentation 'LifeMaps - An Automated Diary System Based on the Structure of Lives', **Sensys** , 2016

The Public Days showcase event 'AsthmaGuide : A Complete Asthma Monitoring System', 2016

Full Paper Presentation 'AsthmaGuide: A smartphone and cloud based asthma system', IEEE Wireless Health 2016

Full Paper Presentation 'Chronic kidney disease detection', IEEE ICHI, 2016

Poster and Demo Presentation 'Detecting Agitated Vocal Events', **SenSys** , 2015

Poster and Demo Presentation 'AsthmaGuide: An Ecosystem for Asthma Monitoring and Advice', **SenSys** , 2015

Project Demonstration UVA Open House, 2014, 2015, 2016, 2017

REFEREE/REVIEWER

Associate Editor Journal: ACM Transactions on Computing for Healthcare

PC member AAAI 2022, 2023, CVPR 2021

TCP member PerIoT 2020 and 2021

Reviewer:
IMWUT (Ubicomp) 2017, 2018, 2019, 2020, 2022
ACM Transactions on Cyber-Physical Systems 2019
IFIP Performance 2018, ISSRE 2018, Heliyon 2018, and DSN 2019

NSF: SERVICE

Served on the Phase I: Big Data and Advanced Analytics (Virtual) SBIR review panel.

Served on NSF Multimodal Sensor Systems for Precision Health Enabled by Data Harnessing, Artificial Intelligence, and Learning (SenSE) panel.

Served on NSF Smart and Connected Health (SCH) panel.

SYRACUSE UNIVERSITY: SERVICE

Served on the SU CUSE grant review panel (2020)

Developed one position for the second round of cluster hiring competition in Aging, Health, and Neuroscience.

Acting as an undergraduate student advisor for 27 undergraduate students.

Contributed as a part of CISE and ECE QE1 exam 2020, 2021, 2022 (Ph.D. Qualifying examination committee).

Contributed as part of seven Ph.D. proposals and four Ph.D. defense committees.

VOLUNTEERING EXPERIENCE

Student Volunteer : Wireless Health 2014, UVA Engineering Alumni Reunions 2014, Hosting Faculty Candidates (2015 & 2016), BUET CSE Festival (2008 & 2011), Bangladesh National Math Olympiad 2008

Co-founder and General Secretary : Association of Bangladeshi Students UVA, 2016-2017

Community Action : Mentored two underprivileged students in their studies, 2014-2017