

Maneesh Bilalpur

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INTERESTS

I am a PhD candidate with core interests in multimodal dialogue understanding for affective behaviors and generation through natural language and computer vision techniques. In my academic journey, I delved into diverse projects, including multimodal depression detection, pose generation, and emotion recognition. Before that, I worked at a vibrant computer vision startup to develop semantic segmentation and object detection solutions for autonomous driving. I am interested in machine learning research positions with real-world product impact.

EDUCATION

- **University of Pittsburgh** Pittsburgh, PA
PhD in Intelligent Systems (School of Computing and Information); GPA: 3.64/4.0 Aug. 2019–Dec. 2025 (expected)
- **IIIT Hyderabad** Hyderabad, India
MS by Research (Electronics Engineering); GPA: 8.5/10.0 July. 2015 – May. 2018
- **VIT University** Vellore, India
Bachelor of Technology (Electronics Engineering); GPA: 8.98/10.0 July. 2011 – May. 2015

EXPERIENCE

- **Industry Research Experience** Bengaluru, India
Computer Vision Researcher at Playment.io (Telus International) August 2018 - July 2019
 - **Privacy-Preserving Visual Redaction:** Developed an API solution for obfuscation of faces and vehicular license plates for GDPR compliance and contributed to its deployment using Docker over AWS cloud environment.
 - **Semantic Segmentation for Autonomous Driving:** Product integration of deep learning-based interactive semantic segmentation solution for automatic annotation of frequent classes. Also developed an approach for vectorization of raster semantic segmentation maps. Contributions have considerably reduced the manual annotators' effort in per-image labelling time.
- **Research Experience**
Graduate Student Researcher
 - **Depression Detection in Families:** Developed mechanisms from natural language, dialogue and facial expressions of mothers and children to show that computational features are better predictors (84% accuracy) for depression than expert annotations (59% accuracy).
 - **Smiles in Social Contexts:** Identified context-agnostic ballistic-timing behavior in naturally occurring smiles. The ballistic-timing was also robust to individual differences such as sex, and ethnicity. Smiles were generated in a virtual agent by grounding an attention-based deep learning model on social context to improve face-to-face interactions.
 - **User-Profiling using EEG:** Perceived differences in facial emotions were used to recognize the gender and emotion among individuals using *eye-gaze* and commercial EEG devices. Developed deep learning and boosting framework to improve prediction performance by over 10% accuracy.

PROGRAMMING SKILLS

- *Programming:* Python, C, MATLAB, C++ (familiar), R
- *Machine Learning:* Pytorch, Keras, Hugging Face, numpy, pandas, scipy, scikit-learn
- *Cloud & Infrastructure:* AWS, Docker
- *Applied domains:* Natural Language Processing, Computer Vision, Speech Processing, Data Science, Deep Learning, Reinforcement Learning, Mixed-Effects Models

SELECT PUBLICATIONS (GOOGLE SCHOLAR)

- **Maneesh Bilalpur**, Mert Inan, Dorsa Zeinali, Jeffrey Cohn, Malihe Alikhani, *Learning to Generate Context-Sensitive Backchannel Smiles for Embodied AI Agents with Applications in Mental Health Dialogues*, Machine Learning for Cognitive and Mental Health Workshop, AAAI 2024.
- Arushi Sharma*, Abhibha Gupta*, **Maneesh Bilalpur***, *Argumentative Stance Prediction: An Exploratory Study on Multimodality and Few-Shot Learning*, In Proceedings of the 10th Workshop on Argument Mining at EMNLP, ACL 2023. [PDF] (* denotes equal contribution)
- **Maneesh Bilalpur**, Saurabh Hinduja, Laura A. Cariola, Lisa B. Sheeber, Nick Allen, Louis-Philippe Morency, Jeffrey F. Cohn, *SHAP-based Prediction of Mother's History of Depression to Understand the Influence on Child Behavior*, International Conference on Multimodal Interaction (ICMI), 2023. [PDF]
- Saurabh Hinduja, Itir Onal Ertugrul, **Maneesh Bilalpur**, Daniel Messinger, Jeffrey F. Cohn, *PyAFAR: Python-based Automated Facial Action Recognition library for use in Infants and Adults*, Affective Computing and Intelligent Interaction (ACII), 2023. [PDF]
- **Maneesh Bilalpur**, Saurabh Hinduja, Laura A. Cariola, Lisa B. Sheeber, Nick Allen, Laszlo A. Jeni, Louis-Philippe Morency, Jeffrey F. Cohn, *Multimodal Feature Selection for Detecting Mothers' Depression in Dyadic Interactions with their Adolescent Offspring*, IEEE International Conference on Automatic Face and Gesture Recognition (FG), 2023. [PDF]
- **Maneesh Bilalpur**, Kenneth Goodrich, Saurabh Hinduja, Jeffrey F. Cohn, *Ballistic Timing of Smiles is Robust to Context, Gender, Ethnicity, and National Differences*, Affective Computing & Intelligent Interaction (ACII), 2022. [PDF]
- Itir Onal Ertugrul, Yeojin Amy Ahn, **Maneesh Bilalpur**, Daniel S. Messinger, Matthew L. Speltz, Jeffrey F. Cohn, *Infant AFAR: Automated facial action recognition in infants*, Behavior Research Methods, 2022. [PDF]
- **Maneesh Bilalpur**, Seyed Mostafa Kia, Tat-Seng Chua and Ramanathan Subramanian, *Discovering Gender Differences in Facial Emotion Recognition via Implicit Behavioral Cues*, Affective Computing & Intelligent Interaction (ACII), 2017. [PDF]
- **Maneesh Bilalpur**, Seyed Mostafa Kia, Manisha Chawla, Tat-Seng Chua, Ramanathan Subramanian, *Gender and Emotion Recognition with Implicit User Signals*, International Conference on Multimodal Interaction (ICMI), 2017. [PDF]
- **Maneesh Bilalpur**, Stefan Winkler, Mohan Kankanhalli, Ramanathan Subramanian, *EEG-based Evaluation of Cognitive Workload Induced by Psychoacoustic Parameters for Data Sonification*, International Conference on Multimodal Interaction (ICMI), 2018. [PDF]
- Viral Parekh*, **Maneesh Bilalpur***, C V Jawahar, Shravan Kumar, Stefan Winkler and Ramanathan Subramanian, *Investigating the generalizability of EEG-based cognitive load estimation across visualizations*, International Conference on Multimodal Interaction (ICMI Late Breaking Works track), 2018. (* equal contribution). [PDF]

HONORS

- Pitt School of Computing and Information Fellow for AY 2019-2020.
- Student Travel Grant award winner for ACII'17 and ICMI'18.
- SIGCHI Gary Marsden Student Development Fund awardee for ICMI'18.
- Recipient of the AAAI'24 student scholarship and volunteer funding.
- Outstanding Reviewer Award at IEEE Face & Gestures Recognition Conference 2024.
- Doctoral Consortium Travel Award FG 2025.
- Pitt Provost's Dissertation Completion Fellowship for Fall 2025.

ACADEMIC SERVICE

- Program committee member for 12th IEEE *International Conference on Healthcare Informatics* (ICHI 2024).
- LREC-COLING Joint International Conference on Computational Linguistics, Language Resources and Evaluation 2024.
- Program committee member for *Workshop on Ambient Intelligence for HealthCare* (AmI4HC) at MICCAI 2023.
- IEEE Conference on Automatic Face & Gestures Recognition (FG) 2020, 2023 & 2024
- International Conference on Multimodal Interaction (ICMI) 2023
- International Joint Conference on Biometrics (IJCB) 2022, 2023

- Member of the executive board for SCI Graduate Student Organization 2020-2021.
- Transactions on Affective Computing, Transactions on Multimedia, Knowledge-Based Systems, and Pattern Recognition