岩手県立大学
ソフトウェア情報学部
Faculty of Software and Information Science

ACHI 2020, The 13th International Conference on Advances in Computer-Human Interactions

ACHI 3 / BAVC: Human Computer Interaction and Behavior Analysis Using Vision Cameras

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Research Interests

- Human Computer Interaction
- Behavior Analysis
- Eye Tracking
- Virtual Reality
- 3D Spherical Display

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BAVC Special Track :: Summary

Recent state-of-the-art computer vision techniques have enabled the detection of facial and body features from images. Many applications are expected to have benefits from these techniques. The real time detection of facial features will lead to the observation of facial emotion changes and of facial muscle movements, which may be important aspects to behavior analysis. The detection of body features will enable an interaction between human and the computer. Moreover, these features can be potentially used for measuring body movements that plays important role in clinical management. This special track invites researchers to publish their works related to human computer interaction and behavior analysis.

BAVC Special Track :: Topics of Interests

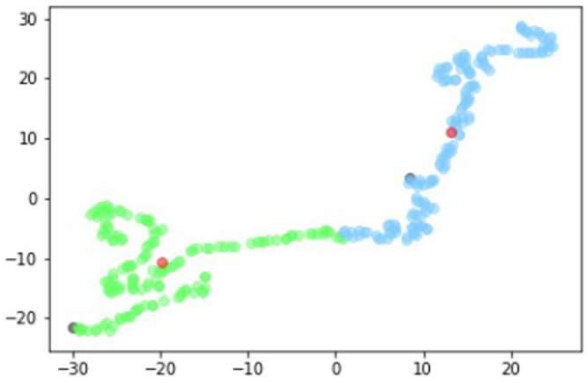
- Facial analysis
- Body motion analysis
- Behavior analysis
- Interactive human computer interaction
- Flexibility training
- Human tracking
- Movement analytics
- Special applications (healthcare, assistive-robotics, special interfaces, etc.)

Summary of Contributions 1/4

Title Engagement Estimation for an E-Learning Environment Application

Authors Win Shwe Sin Khine, Shinobu Hasegawa, and Kazunori Kotani

- This paper takes advantage of style transfer techniques to obtain the basic facial features and remove other features that are not useful for estimating engagement through the virtual environment.
- Based on the high-dimensional data from the 6th fully connected layer of the VGG-16 model compressed with t-Distributed Stochastic Neighbor Embedding (t-SNE), the fully expressive (peak) and neutral facial expressions were successfully classified for each frame using k-means.

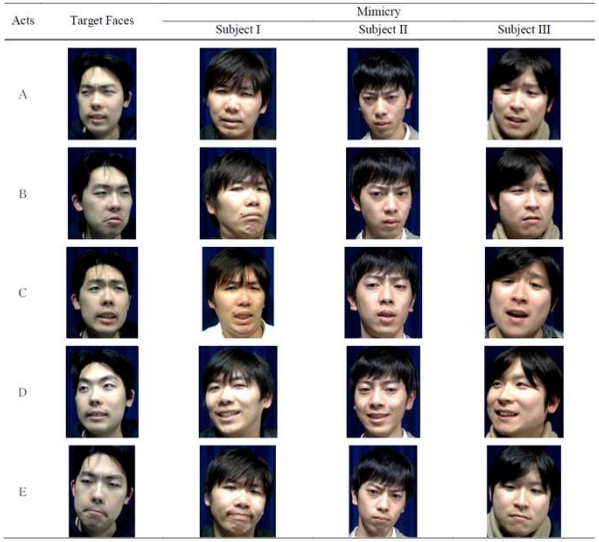


Summary of Contributions 2/4

Title Facial Mimicry Training Based on 3D Morphable Face Models

Authors O. D. A. Prima, Hisayoshi Ito, Takahiro Tomizawa, Takashi Imabuchi

- This study proposes a self-learning-based expression training system by evaluating the similarity of facial images based on the shape derived from the 3D Morphable Face Model (3DMM).
- Experiment results show that the facial appearance between subjects and their corresponding mimic targets are highly correlated.



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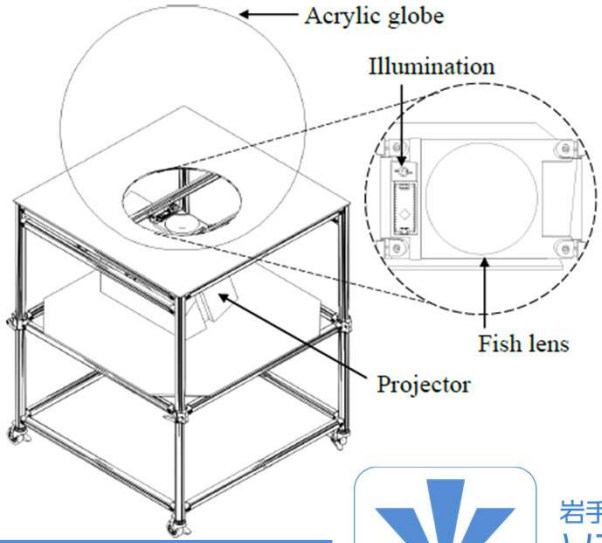
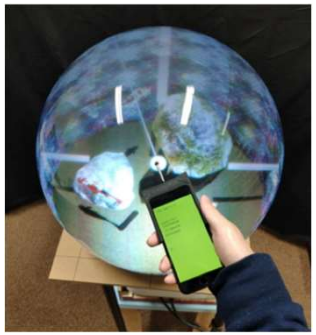
Summary of Contributions 3/4

Title A Perspective-Corrected Stylus Pen for 3D Interaction

Authors Rintaro Takahashi, Katsuyoshi Hotta, Oky Dicky Ardiansyah Prima, Hisayoshi Ito

This study proposes a novel perspective-corrected stylus pen that can be used for three-dimensional (3D) interaction with a 3D spherical display. The camera is set up at the bottom of the display to detect the contact point between the pointing device and the display surface, whereas the pointing device gets its 3D orientation from the smartphone's built-in Inertial Measurement Unit (IMU).





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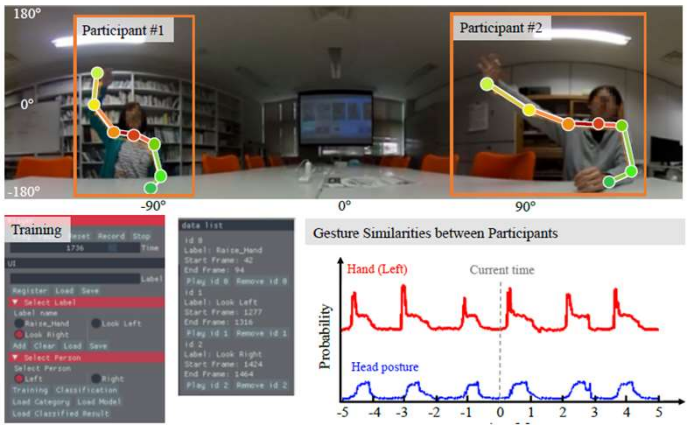
Summary of Contributions 4/4

Title Toward Automated Analysis of Communication Mirroring

Authors Kumiko Hosogoe, Miyu Nakano, Oky Dicky Ardiansyah Prima, Yuta Ono

- This study proposes a framework to perform a time series analysis based on Dynamic Time Warping (DTW) to determine whether communication mirroring has been established. The framework uses human pose estimation techniques to track hand gestures of two persons during a conversation.
- Experiments show that the DTW was able to detect mirroring acts having distinct gestures.



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Conclusion & Future Perspective

- This special track “BAVC” provided a forum for discussing research topics on human-computer interaction and human behavioral analysis using computer vision, as well as issues related to each topic and their solutions.
- Future perspectives regarding the topic include questions concerning whether an integrated analysis of facial image information and detailed facial landmarks is necessary in the observation of changes in certain facial expressions, and whether all the geometric information (skeletal information) of the body is required in the evaluation of resembled body movements.