

# Investigating the significance of head orientation in Automatic Emotion Recognition Systems

Yatheendra Pravan Kidambi Murali, Master of Science in Computer Science  
University of Dublin, Trinity College, 2022

Supervisor: Dr. Khurshid Ahmad

Non-verbal communication has multiple modalities. Gestures and head orientation encompass significant emotional cues. A case study analysis of 221 spontaneous videos is presented which evaluates the agreement of emotion recognition systems based on profession and investigates the relationship between head orientation and perception of emotions. These videos are of charismatic people (like CEOs and Politicians) or by people who represent them (Spokesperson). A semi-spontaneous video dataset is created, and the relationship of head orientation (represented through Euler Angles) with emotions identified by prominent emotion recognition systems (EMOTIENT FACET and AFFECTIVA AFFDEX) is investigated. The two systems have a good statistical agreement on the estimated head direction and the estimated Euler angles are highly correlated. There is a variation in the distribution of Euler angles between the systems and the distribution varies for different emotions. The relationship between head orientation and emotions is explored using regression analysis and fuzzification of Euler angles, and the results are in line with the evidence from the literature. Evidence for the association of specific head orientation for each emotion is found to be consistent within the system (intra-system) and varies between systems.