Learning based Visual Engagement and Self-Efficacy
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Applications: Trauma-Recovery
1. Each year, over 3 million people in the United States are affected by post-traumatic stress, a serious mental condition.
2. Mental trauma is often associated with symptoms like, avoidance of treatment, negative beliefs, hyper arousal, cognitive impairments etc.
4. Personalization and automated adaption in self-help websites can positively aid people with mental health issues.

Mood-aware Contextual Engagement Pipeline

Why Engagement and Self-Efficacy?
1. Engagement is an indispensable part of user experience and interaction with applications.
2. Vision and learning based methods can provide a proactive, scalable and cost-effective web-based treatment for trauma recovery by analyzing webcast feeds.
3. Self-reported user efficacy has been found, in many psychology studies, to be highly correlated with outcomes.
4. Self-efficacy is a key component of social cognitive theory and refers to a perceived capability to cope with challenges and uncertainty in stressful situations.
5. The website and task can adapt to enhance or maintain engagement and recovery based on reliable and quantifiable engagement and self-efficacy measure.

EASE Dataset
1. Web-intervention used for trauma-recovery: http://ease.vast.uccs.edu/
2. Participants consisted of total 110 subjects with 88 Female, 17 Male, 5 did not specify in the age group of 18-79 years, with 80% being under the age of 46.
3. Study comprised of 3 Sessions using six Modules of trauma-recovery: Relaxation, Triggers, Social-Support, Self-Talk, Proactive, Helpfulness, Coping.
4. Face data, audio data (biomarkers input data such as conductance, respiration, EEG) was captured from subjects while they were interacting with website while performing self-regulation exercises.
5. Self-Reports were collected from subjects about their engagement level, mood (Very Short Profile of Mood States (POMS) questionnaire) and self-efficacy measures.

RESULTS AND PUBLICATIONS
1. Demonstration of contextual engagement in two different tasks within the recovery regime: “Relaxation” and “Triggers”.
2. Explored relationship of subject’s mood as an initial parameter for engagement estimation.
3. Developed automated mood predictors for mood sub-scales and total mood disturbance.

Experiment Details
1. Features: 20 AUs using OpenFace Framework each from 30 sec video segment (900 frames/segment).
3. Learning Protocol for Contextual Engagement Models:
   • Training on Relaxation Module, Testing on Trigger Module & Relaxation Module
   • Train on Trigger Module, Testing on Trigger Module & Relaxation Module
   • Training on mixed (Relaxation & Trigger), testing on Trigger Module & Relaxation Module
4. Mood-Aware Engagement Prediction: Leave-One-Subject-Out methodology: Training on Relaxation Module & testing on Relaxation Module, Training of Trigger Module & Testing on Trigger Module
5. Comparison of self-reported mood to automated mood with evaluation metric: Regression for automated mood-predictors.

Related Publications
2. S.Dhamija, T. Boult “Automated Mood-aware Engagement Prediction” ACLI 2017

Acknowledgements: The work support in part by NSF Research Grant SCH-E 1418520