Vision based Physiological and Emotional Signal Analysis with Application to Mental Disorder Diagnosis

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ABSTRACT

Face images and videos contain rich visual biometric signals from apparent signals like attribute and identity characteristics to subtle signals corresponding to physiological and emotional states. Benefit from the great success of deep learning methods, tremendous progress has been made on apparent visual signals analysis. However, subtle signal analysis still faces big challenges: indistinguishable pattern, low PSNR, and transient duration. Attempts to resolve these challenges usually rely on engineering designs to extract and enhance the subtle signals. Our recent work aims to improve the robustness of physiological and emotional signal analysis via signal disentanglement, context modeling, and semi-supervised learning. Since people with mental disorders is likely to demonstrate subtle visual signals, we also propose to fuse individual face visual signals to perform mental disorder diagnosis like AD apathy and anxiety prediction.

CCS Concepts/ACM Classifiers

• Computing methodologies ~ Artificial intelligence

• Computing methodologies ~ Machine learning

Author Keywords

Physiological signal; feature disentanglement; context

BIOGRAPHY

Hu Han is a Professor at the Institute of Computing Technology (ICT), Chinese Academy of Sciences (CAS). His research interests include computer vision, pattern recognition, biometrics, and medical image analysis. He has published more than 80 papers in journals and conferences including IEEE Trans. PAMI, IEEE Trans. IP, IEEE Trans. IFS, IEEE Trans. BIOM, IEEE Trans. MI, IEEE Trans. CSVT, CVPR, NeurIPS, ECCV, MICCAI, etc. with more than 5100 Google Scholar citations. He was a recipient of the IEEE Signal Processing Society Best Paper Award (2020), ICCV2021 Human-centric Trustworthy Computer Vision Best Paper Award, IEEE FG2019 Best Poster Presentation Award, and CCBR2016/2018 Best Student/Poster Awards. He is/was the Associate Editor of Pattern Recognition, the Area Chair of

ECCV2022/IJCB2022/ICPR2020, and SPC of IJCAI2021, and LAC of VALSE. He has co-organized a number of special sessions and workshops of "vision based physiological signal analysis" in ICCV2021, CVPR2020, FG2019/20/21/23, etc.

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