Abstract: A New Prediction Method of Constitution Diagnosis using Speech Signals and Facial Characteristics for Personalized Medicine

Bum Ju Lee, Boncho Ku, Kihyun Park, Keun Ho Kim, Jong Yeol Kim*
Division of Constitutional Medicine Research, Korea Institute of Oriental Medicine
jupiter-lee@hanmail.net, secondmoon@kiom.re.kr, ojmylove@kiom.re.kr, m70@kiom.re.kr, ssmed@kiom.re.kr
** Corresponding author: Jong Yeol Kim, 1672 Yuseongdae-ro, Yuseong-gu, Deajeon 305-811, Republic of Korea, Email: jupiter-lee@hanmail.net, Telephone: +82-42-861-9593, Fax: +82-42-868-9480*

Abstract

Constitution diagnosis is one of the important research fields for personalized medicine, because personal constitution diagnosis can improve the effectiveness of prescribed medications and help in detecting risk factors for specific diseases in the early stages. In this paper, we propose a novel method for predicting constitutional types using only face and speech data. Through classification experiments of three constitutional types using face and speech features of 514 subjects, the AUC (area under ROC curve) values of diagnosis models in age- and gender-specific groups ranged from 0.64 to 0.89. We demonstrated that performance of a combination of face and speech features was better than that of the individual use of face or speech, and we identified a compact and useful feature subset for diagnosing the constitutional types. The utility of discriminative features for constitution diagnosis via statistical analysis of features is also described. Our results can be used for the development of an automatic constitution diagnosis tool and may help in improving the effectiveness of prescribed medications and developing personalized medicine.

Acknowledgements

This work was supported in part by National Research Foundation of Korea (NRF) grant funded by the Korea government (MEST) (20110027738).