2nd International Conference on
Food Science and Bioprocess Technology

October 1-2, 2018   Frankfurt, Germany

Automatic Analysis of Microaneurysms Turnover to Diagnose the Progression of Diabetic Retinopathy

Jiawei Xu[1]*, Xiaoqin Zhang[2], Huiling Chen[2], Jing Li[3], Jin Zhang[4], Ling Shao[5] and **Gang Wang[6]**
[1]Newcastle University, UK
[2]Wenzhou University, China
[3]University of Illinois at Chicago, USA
[4]University of California, USA
[5]Inception Institute of Artificial Intelligence, UAE
[6]Jilin University, China

Diabetic retinopathy (DR) is one of the most common micro vascular complications and its early detection is critical for the prevention of vision loss. Recent studies have indicated that micro aneurysms (MAs) are the hallmark of DR. However, the detection of MAs relies on trained clinicians and relatively expensive software. Moreover, manual errors often lower the accuracy of this detection. Therefore, an automatic analysis technique is highly demanded in the detection of Dr. progression. In this paper, we present a novel and complete methodology involving two different ways from the view of MAs turnover and pathological risk factors to diagnose the progression of DR. Specifically, one approach follows the traditional image analysis-based roadmap to obtain MAs turnover. The other investigates seven pathological features, related with MAs turnover, to classify the unchanged, new, and resolved MAs by means of statistical analysis and pattern classification techniques. The evaluations on Grampian diabetes database show that the proposed image analysis method could achieve a sensitivity of 94% and a specificity of 93%, while the classification model could achieve 89% sensitivity and 88% specificity, respectively. We also analyzed the potential weight of pathological risk factors leading to the MAs turnover, which could provide an alternative guidance for the progression of Dr. than traditional detection methods. In conclusion, this study provides a novel and non invasive detection technique for early diagnosis of diabetic retinopathy with a competitive accuracy.

Biography:

Jiawei Xu is working with the School of Computing, Newcastle University in 2017. He was a visiting post doc (2016) in National Institutes of Health, United States of America. He received the Ph.D. (2012-2015) in School of Computer Science, University of Lincoln, United Kingdom, M.Sc. degree (2009-2011) from Department of Electronic Engineering, Hallym University, Korea and B.S. (2003-2007) from Department of Automotive Engineering, Shanghai University of Engineering Science, China. His research interests include biological vision modeling, pattern recognition and image/video processing. He is a member of the IEEE.

Madridge J Food Technol. 2018
MJFT an open access journal

Food Tech-2018
October 1-2, 2018

Conference Proceedings

Page 50