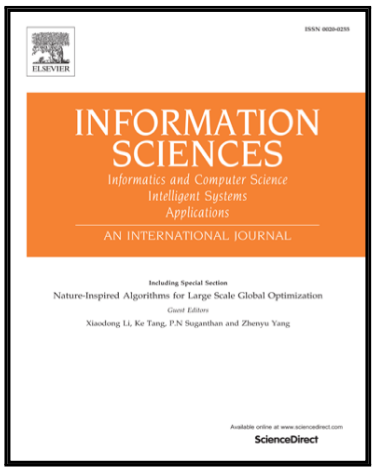
Accepted Manuscript



Visual Attention Analysis and Prediction on Human Faces

Xiongkuo Min, Guangtao Zhai, Ke Gu, Jing Liu, Shiqi Wang, Xinfeng Zhang, Xiaokang Yang

PII: S0020-0255(16)30961-6
DOI: 10.1016/j.ins.2017.08.040
Reference: INS 13044

To appear in: *Information Sciences*

Received date: 18 September 2016
Revised date: 7 August 2017
Accepted date: 9 August 2017

Please cite this article as: Xiongkuo Min, Guangtao Zhai, Ke Gu, Jing Liu, Shiqi Wang, Xinfeng Zhang, Xiaokang Yang, Visual Attention Analysis and Prediction on Human Faces, *Information Sciences* (2017), doi: 10.1016/j.ins.2017.08.040

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Visual Attention Analysis and Prediction on Human Faces

Xiongkuo Min[a], Guangtao Zhai[a,*], Ke Gu[b], Jing Liu[c], Shiqi Wang[d], Xinfeng Zhang[e], Xiaokang Yang[a]

[a]*Institute of Image Communication and Network Engineering, Shanghai Jiao Tong University, China*
[b]*Beijing Key Laboratory of Computational Intelligence and Intelligent System, Faculty of Information Technology, Beijing University of Technology, China*
[c]*School of Electrical and Information Engineering, Tianjin University, China*
[d]*Department of Computer Science, City University of Hong Kong, Hong Kong SAR*
[e]*School of Computer Science and Engineering, Nanyang Technological University, Singapore*

Abstract

Human faces are almost always the focus of visual attention because of the rich semantic information therein. While some visual attention models incorporating face cues indeed perform better in images with faces, yet there is no systematic analysis of the deployment of visual attention on human faces in the context of visual attention modelling, nor is there any specific attention model designed for face images. On faces, many high-level factors have influence on visual attention. To investigate visual attention on human faces, we first construct a Visual Attention database for Faces (VAF database), which is composed of 481 face images along with eye-tracking data of 22 viewers. Statistics of the eye-movement data show that some high-level factors such as face size, facial features and face pose have impact on visual attention. Thus we propose to build visual attention models specifically for face images through combining low-level saliency calculated by traditional saliency models with high-level facial features. Efficiency of the built models is verified on the VAF database. When combined with high-level facial features, most saliency models can achieve better performance.

Keywords: Visual attention, human face, saliency map, fixation distribution, high-level factors, facial features.

*Corresponding author
E-mail addresses: minxiongkuo@gmail.com (X. Min), zhaiguangtao@sjtu.edu.cn (G. Zhai), guke@bjut.edu.cn (K. Gu), jliu_tju@tju.edu.cn (J. Liu), shiqwang@cityu.edu.hk (S. Wang), xfzhang@ntu.edu.sg (X. Zhang), xkyang@sjtu.edu.cn (X. Yang).

Download English Version:

https://daneshyari.com/en/article/4944171

Download Persian Version:

https://daneshyari.com/article/4944171

Daneshyari.com