SHUAI MA

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EDUCATION

M.S., University of Chinese Academy of Sciences, *Computer Science*, ISCAS HCI Lab 2017.9 – 2020.7

B.S., Harbin Institute of Technology, *Software Engineering*, Software School Rank: $4th/170$ 2013.9 – 2017.7

EMPLOYMENT

Lohas Technology Machine Learning Group 2017.9 – 2017.12

ECG signal recognition model based on Faster-rcnn

- Based on the ROI layer idea, the ECG recognition model of Andrew Ng is investigated and reproduced to avoid redundant feature extraction operations. Training and testing on MIT-BIH data set, R-wave recognition recall up to 99.3%。
- Because noise interferes ECG signal greatly, the morphological features of ECG signal are studied unsupervised by using condensation clustering to achieve precise denoising.

Netease Beijing R&D Center Youdao 2018.1 – 2018.3

A Rule + Statistics-based Model for Classical Chinese Translation

- Scrapy is used to write a general crawler interface, which can crawl the required corpus data by passing in parameters.
- Write map-reduce program to download data from Hadoop cluster and realize corpus alignment function to complete word-to-word correspondence between classical Chinese and modern Chinese translation.
- Research, design and implementation of classical Chinese word segmentation.

RESEARCHES

Evaluation of neurological function in mobile environment based on MRI 2016.10 – 2017.12

Application practice: Neurological function evaluation method based on mobile environment, in cooperation with Peking Union Medical College Hospital, aims to assist in predicting nervous system diseases.

- Random Forest was used to classify the hand movement data and magnetic resonance imaging (MR) data of more than 1,000 community residents, and GBDT was used to predict the patients'MR indices and to assist in the diagnosis of degenerative neurological diseases such as Parkinson's disease.
- We designed an implicit interaction mode in our daily life. We cleaned the collected screen interactive data, extracted features, reduced dimensions, and balanced the samples. The training classifier achieves nearly 90% prediction accuracy of PVWMH, DWMH, SBI and other indicators. Accepted by ACM CHI 2018 [2].

Adaptive Review for MOOC Learning via Reflection Prompts 2017.10 – 2017.12

- The aim is to solve the shortcomings of traditional MOOC learning, such as one-way information flow, low completion rate and lack of interaction.
- We propose a self-adaptive reflection method based on NLP, which allows users to describe in real time what they don't know or know in the form of natural language in the learning process. By matching the method based on dynamic experience base and LSA (latent semantic analysis), we can help users to jump to confusing point accurately, and recommend algorithms based on collaborative filtering. Users recommend the most appropriate quiz.

Improving Well-Being via Prompting Gratitude Reflections 2017.10 – 2018.1

- The aim is to use interactive technology to help people (especially those with depressive symptoms) reflect on the positive things in life so as to enhance positive emotions.
- NLP technology is used to extract keywords, including insight words, causal words, verbs, self-descriptors and so on. And extract the features of words (whether there are such words as realization), word count, part of speech (and whether there are proper nouns).
- Writing quality can be expressed in two dimensions: level of detail (low, medium, high), participation in cognitive process (low, medium and high), which can be divided into nine states. According to the writing state, users can be guided to write in real time through human-computer dialogue. Accepted by ACM CHI 2018 [3].

Integrating User Preference with Deep View Proposal Network 2018.3 – 2018.9

- The aim is to help every user who can't take a picture to compose a picture he likes.

- The Photo Composition Recommendation Network (VPN) is designed and trained. VPN can input a photo at the speed of 75 FPS and output the sub-composition of topN ranking corresponding to the photo.
- By extracting user preferences for photo composition, a 32-dimensional feature is designed. Through interactive machine learning, a preference model is trained iteratively for each user. VPN and Preference model are embedded. The final model outperforms other DL models and pure VPN models in Average Bad/Good Rate, nDCG, Top1 Selection Rate and other indicators. Accepted by ACM CHI 2019[1].

Identifying Central Nervous System Disorders from Daily Walking Activities 2018.3 – Now

- The aim is to monitor users'gait in a non-task way in daily life, so as to predict users' risk of central nervous system diseases.
- Through gait recognition and face recognition technology, the non-gait actions of the target user and the crowd disturbed by Kinect in front of the camera are filtered out.
- Gait data of patients with central nervous system diseases and normal people were collected in the clinic of Union Medical College Hospital. The 68-dimensional gait pathological characteristics were extracted and the disease was divided into two categories. AUC reached 0.96. Submitted to ACM Ubicomp 2018。

Improving Recognozers' Performance by Leveraging the Continuity of Gesture Sequence 2018.3 – Now

- The aim is to solve the problem that the gesture set is too complex and the user's cognitive burden is too heavy, and the shape of similar gestures is often confused.
- Dynamic Bayesian networks and partially observable Markov decision processes are used to estimate the most likely next step user gesture intentions in the current interaction context. Submitted to ACM IUI 2019.

Assistanting Instructor's MOOC Teaching via Visualizing Students' Emotional Feedback 2018.9 – Now

- In the existing MOOC live teaching, teachers can not know whether the students understand the knowledge they have just talked about in time as in the real classroom.
- Through facial feature extraction and expression recognition technology, the training model obtains students'emotional, cognitive load and engagement data, and presents them to teachers through visualization technology after summarizing and processing.

♡ HONORS & AWARDS

ACM CHI 2019 Best Paper Honorable Mention (1^{st} author) 2019.3
Reviewer of ACM CHI 2019 2018.10-2019.1
National Scholarship for Graduate Students 2018.10
Excellent Communist Party Members and Excellent Student Cadresof UCAS 2018.7
Special Award for Undergraduates of Harbin University of Technology 2017
National Scholarship for Undergraduates×2 2014-2016
Excellent Graduates of HIT(*Top*1%), HIT outstanding regiment soldiers, outstanding student cadres 2013-2017

i COMPETITIONS

Huawei Cup Free Software Programming Competition *The first prize* 2018.7
Kaggle WAD Video Segmentation Challenge (CVPR 2018)Semantic Segmentation and Recognition of Road Vehicles $4th/141teams$ 2018.6
EmotiW 2018 (ICMI Challenge) International Emotional Recognition Competition *No. 23 in the world* 2018.6
The Fifth National Marine Vehicle Design and Manufacturing Competition *First prize* 2016.8
Eighteenth National Robot Championship *First Prize* ×2 2016.7
Tianchi Big Data Competition-Sina Weibo Interactive Prediction *Top*5% 2015.9

PUBLICATIONS

[1] **Shuai Ma**, Zijun Wei, Feng Tian, Xiangmin Fan, Jianming Zhang, Xiaohui Shen, Zhe Lin, Jin Huang, Radomir Mech, Dimitris Samaras, and Hongan Wang. SmartEye: Assisting Instant Photo Taking via Integrating User Preference with Deep View Proposal Network. In *Proceedings of the 37th Annual ACM Conference on Human Factors in Computing Systems (**CHI 2019**).*

[2] Jing Gao, Feng Tian, Junjun Fan, Dakuo Wang, Xiangmin Fan, Yicheng Zhu, **Shuai Ma**, Jin Huang, and Hongan Wang. Implicit Detection of Motor Impairment in Parkinson's Disease from Everyday Smartphone Interactions. In *Proceedings of the 36th Annual ACM Conference Extended Abstracts on Human Factors in Computing Systems (**CHI EA 2018**).*

[3] Liuping Wang, Xiangmin Fan, Feng Tian, Lingjia Deng, **Shuai Ma**, Jin Huang, and Hongan Wang. mirrorU: Scaffolding Emotional Reflection via In-Situ Assessment and Interactive Feedback. In *Proceedings of the 36th Annual ACM Conference Extended Abstracts on Human Factors in Computing Systems (**CHI EA 2018**).*