Bingyuan Liu

Senior Software Engineer · Deep Learning and Computer Vision

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WORK Experience

Alibaba Group, Inc. *Hangzhou, China*

Senior Software Engineer on Applied Deep Learning Algorithm *Apr. 2016 - PRESENT*

- **Responsible for the designing and developing of OCR (Optical Character Recognition) Algorithm (from 04/2016 to present).** Designed the OCR algorithm framework for recognizing Chinese business license. Implemented the main modules including image pre-processing, text location, character recognizer and text line recognizer with deep learning models of CNN and LSTM. The algorithm has been applied in the products of Alipay, DingTalk and Alibaba Cloud for user validation. The precision in real environment outperforms 90%.
- **Responsible for the designing and developing of image algorithm on the product of PAI (Platform of Artificial Intelligence) of Alibaba Cloud (from 10/2016 to present).** The goal of the project is to design and develop deep learning based image algorithm modules on PAI. The users of the platform can easily and efficiently train deep learning models with their datasets. I have developed Faster-RCNN modules for object detection and Covolutional LSTM modules for text line recognition. Both modules are implemented on the Tensorflow framework.

Huawei Technologies Co. Ltd. *Nanjing, China*

Senior Software Engineer at Big Data Lab *Jul. 2015 - Apr. 2016*

- **China Mobile customer data analysis project (from 08/2015 to 03/2016).** Responsible for the NLP and machine learning module. Designed and developed an intelligent text analysis system for the customer service center of China Mobile. The system has the features of key words mining, text annotation and sentiment analysis. The main techniques cover a wide range of NLP and machine learning algorithms, including Chinese words segmentation, Word2vec, pattern matching and associate learning.
- **Knowledge graph in movie domain (from 07/2015 to 12/2016).** Designed and implemented some machine learning and NLP modules, including word embedding, concept annotation and entity relationship mining. The main techniques we employed are Word2Vec, SVM, CNN and LDA model.

Research Experience

Institue of Automation, Chinese Academy of Sciences *Beijing, China*

Ph.D. in Computer Sciences - Computer Vision *Sep. 2010 - Jul. 2015*

- **Deep learning models for image representation and understanding (from 09/2012 to 06/2015).** Motivated by sparse feature learning and hierarchical architecture,we proposed several deep learning based models to learn more robust and distinctive image features and improve the performance of image classification. We also tried to integrate deep learning model and classical image recognition pipeline. Several papers were published in the related international journals and conferences.
- **Spatial structure information learning for image feature extraction (from 09/2010 to 09/2012).** The spatial structures within image is significant for the task of image understanding. However the traditional image recognition models lack enough spatial information. To address the issue, we proposed several machine learning based models for better extracting the spatial information and improve the performance of image recognition. Two papers were published in the related international journals and conferences.

Education

Institute of Automation, Chinese Academy of Sciences *Beijing, China*

Ph.D. in Computer Science *Sep. 2010 - Jun. 2015*

- Under the supervision of Hanqing Lu
- Research Areas: Deep Learning, image classification and object detection
- Published seven papers on the related international conferences and journals
- Got National Scholarship which is given to top students in China.

Zhejiang University *Hangzhou, China*

B.S. in Information Science and Communication Engineering Rank: 25/210 GPA: 4.29/5.0 *Sep. 2006 - Jul. 2010*

- Several Outstanding Student awards and Outstanding Graduate of Zhejiang University.
- Second prize in National Undergraduate Electronic Design Contest.

Publications

- Jing Liu, **Bingyuan Liu**, Zechao Li, Hanqing Lu: **Detection Guided Deconvolutinal Network for Hierarchical Feature Learning**. Pattern Recognition 48(8): 2645-2655, 2015.
- **Bingyuan Liu**, Jing Liu, Hanqing Lu: **Learning representative and discriminative image representation by deep appearance and spatial coding**. Computer Vision and Image Understanding 136: 23-31, 2015.
- Yong Li, Jing Liu, Yuhang Wang, **Bingyuan Liu**, Jun Fu, Yunze Gao, Hui Wu, Hang Song, Peng Ying, Hanqing Lu: **Hybrid Learning Framework for Large-Scale Web Image Annotation and Localization**. CLEF (Working Notes), 2015. (2nd place in ImageCLEF 2015)
- **Bingyuan Liu**, Jing Liu, Xiao Bai, Hanqing Lu: **Regularized Hierarchical Feature Learning with Non-Negative Sparsity and Selectivity for Image Classification**. International Conference on Pattern and Recognition (ICPR), 2014.
- **Bingyuan Liu**, Jing Liu, Jinqiao Wang, Hanqing Lu: **Learning a Representative and Discriminative Part Model with Deep Convolutional Features for Scene Recognition**. Asian Conference on Computer Vision (ACCV), 2014.
- **Bingyuan Liu**, Jing Liu, Zechao Li, Hanqing Lu: **Image Representation Learning by Deep Appearance and Spatial Coding**. Asian Conference on Computer Vision (ACCV), 2014.
- **Bingyuan Liu**, Jing Liu, Hanqing Lu: **Adaptive Spatial Partition Learning for Image Classification**. Neurocomputing 142: 282-290, 2014.

Skills

Languages: C++, Python, Shell
Frameworks: Caffe, TensorFlow, Hadoop

Awards

2015	**2nd Place**, ImageCLEF Scalable Image Annotation Challenge	*Toulouse, France*
2014	**2nd Place**, National Smart-city Technology Challenge - object detection task	*Beijing, China*
2014	**1st Place**, Team Table Tennis Championships of Chinese Academy of Sciences	*Beijing, China*

Personal

- **Strongly interested in computer science, especially computer vision and machine learning.**
- **Positive, reliable and hard working.**
- **Good at thinking and self-motivated.Quickly adapt to challenging works.**
- **Hobbies: Table tennis, Basketball, Guitar, Reading**