

# Weihua Chen

Ph.D. Candidate in Pattern Recognition

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## Education & Eexperience

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- 09/2014 - Present **National Laboratory of Pattern Recognition (NLPR),  
Institute of Automation, Chinese Academy of Sciences (CASIA), Beijing, China**  
Ph.D. (expected Dec. 2017) in Pattern Recognition, advised by Prof. Kaiqi Huang  
Research interests include computer vision and deep learning
- 08/2012 - 08/2014 **NLPR, CASIA, Beijing, China**  
Algorithm Engineer in Video Surveillance
- 09/2009 - 07/2012 **Beijing Jiaotong University**  
M.Eng. in Singal and Information Processing, advised by Prof. Zhenjiang Miao
- 09/2005 - 07/2009 **Beijing Jiaotong University**  
B.Eng. in Computer Science and Technology

## Research

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- 09/2015 - Present **Person Re-identification** C++, Python, Caffee  
Solving person re-identification from both ranking and classification aspects. Firstly we associated two kinds of losses in a multi-task deep network [accepted to AAAI2017]. Secondly we designed a quadruplet loss which took advantages of both ranking and classification losses [accepted to CVPR2017].
- 09/2013 - 09/2015 **Multi-Camera Multi-Object Tracking** C++, Matlab, OpenCV  
Developing a multi-object tracking algorithm. Firstly we achieved a robust and real-time single object tracking to produce tracklets with high confidences [accepted to ICCV VOT2013]. Then we represented tracklets with PMCSHR features and associated tracklets in multiple cameras [accepted to ICIP2014]. At last, an equalised graphical model was proposed to solve the imbalance during associating the tracklets in multiple cameras and a new benchmark was introduced for multi-object multi-camera tracking [accepted to Trans.CSVT2016].

## Projects & Contests

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- 09/2014 - 09/2015 **A Multi-Camera Tracking System (See <https://github.com/cwhgn/EGTracker>)** C++, OpenCV  
- Detection: a  $\Omega$ -shape processor to detect head-shoulders and filter the results from DPM;  
- Single object tracking: particle filter based on a combination of features using IPCA;  
- Multi-object tracking: global association using an equalized global graphical model, where PMC-SHR was used for feature extraction and MAP was adopted for the graphical model.
- 01/2014 - 08/2014 **The MCT Challenge in ECCV2014 (See <http://mct.idealtest.org>)** Matlab  
- Built a multi-camera multi-object tracking dataset called MCT\_NLPR;  
- Designed the evaluation criterion and implemented the evaluation kit for participants alone;  
- Full charge of technical support and checked participants' results under the evaluation kit.
- 09/2013 - 12/2013 **The VOT Challenge in ICCV2013 (See <http://www.votchallenge.net/vot2013>)** C++, OpenCV  
- Designed an invariant feature using IPCA to achieve a real-time single object tracking;  
- Our tracker achieved 4th/27 in accuracy rank and 7th/27 in final rank under experiment baseline.

12/2012 - 08/2013	<b>A Real-Time Meeting Attendance Detection System for A Hall</b> - Built a system used for detecting the attendance at a meeting in a 3000-seats hall; - Included UI design, data communication and detection algorithm.	C++, OpenCV, MySQL
07/2012 - 11/2012	<b>Object Detection in Embedded System</b> - Improved object detection functions in OpenCV, which are faster for Embedded System; - Created some functions, e.g. cvThin(), for practical applications.	C++, OpenCV
07/2011 - 06/2012	<b>Face Exaggeration Project for SIEMENS Company</b> - Implemented image deformation on 2D Image; - Controlled the deformation via 68 points gained from ASM on human face.	C++, OpenCV

## Publications

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- [1] **Beyond Triplet Loss: A Deep Quadruplet Network for Person Re-identification**  
Weihua Chen, Xiaotang Chen, Jianguo Zhang, Kaiqi Huang  
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), **Spotlight**, 2017
- [2] **A Multi-task Deep Network for Person Re-identification**  
Weihua Chen, Xiaotang Chen, Jianguo Zhang, Kaiqi Huang  
The Thirty-First AAAI Conference on Artificial Intelligence (AAAI), **Oral**, 2017.
- [3] **An Equalised Global Graphical Model-Based Approach for Multi-Camera Object Tracking**  
Weihua Chen, Lijun Cao, Xiaotang Chen, Kaiqi Huang  
IEEE Transactions on Circuits and Systems for Video Technology (TCSVT), 2016.
- [4] **A Novel Solution For Multi-Camera Object Tracking**  
Weihua Chen, Lijun Cao, Xiaotang Chen, Kaiqi Huang  
IEEE International Conference on Image Processing (ICIP), 2014.
- [5] **An Adaptive Combination of Multiple Features for Robust Tracking in Real Scene**  
Weihua Chen, Lijun Cao, Junge Zhang, Kaiqi Huang  
IEEE International Conference on Computer Vision Workshop on Visual Object Tracking Challenge (ICCV VOT), **Oral**, 2013.

## Awards

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07/2006 - 09/2011	<b>First-class scholarship</b>	4 times
07/2009	<b>Beijing Outstanding Graduates</b>	Top 0.1%
09/2006	<b>Sony Scholarship for Outstanding Student</b>	Top 0.1%
09/2006	<b>3rd Prize in National Physical Competition (Nationwide)</b>	Undergraduate Group
09/2004	<b>2nd Prize in National Mathematics Competition (Liaoning Province)</b>	Senior High Group
09/2004	<b>2nd Prize in Chinese Physics Olympiad (Nationwide)</b>	Senior High Group

## Social Activities

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09/2007 - 09/2008	<b>President of University Student Association of Science and Technology of CS Department</b> - Beijing Jiaotong University 3rd College Students Technological Work Competition; - Beijing Jiaotong University 2nd ACM Collegiate Programming Contest.
09/2006 - 09/2007	<b>President of Beijing Jiaotong University Chess Association</b> - The 7th Beijing Chess Tournament between Colleges and Universities; - Beijing Jiaotong University 10th Chess and Card Competition.

## Skills

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### Programming Languages

- Proficient in C/C++, Python, and Matlab. Experience with Java.

### Tools and Frameworks

- Proficient in Caffe and OpenCV.