# Curriculum Vitae

**PERSONAL INFORMATION**

Name: Zhang, Fang-Lue                    Date of birth: 28/08/1988

URL for web site:    http://cg.cs.tsinghua.edu.cn/people/~fanglue/

Email: z.fanglue@gmail.com

- **EDUCATION AND EXPERIENCE**

Jan 2015 – Now         Postdoctoral Research Associate
                       Department of Computer Science and Technology, Tsinghua University, China
Sept 2009 – Jan 2015   PhD
                       Department of Computer Science and Technology, Tsinghua University, China
Sept 2005 – Jun 2009   BSc
                       Department of Digital Media, Zhejiang University, China

- **PUBLICATIONS**

Robust Background Identification for Dynamic Video Editing
**Fang-Lue Zhang,** Xian Wu, Jue Wang, Hao-Tian Zhang, Shi-Min Hu*
Accepted by SIGGRAPH Asia 2016

PlenoPatch: Patch-based Plenoptic Image Manipulation
**Fang-Lue Zhang,** JueWang, Eli Shechtman, Zi-Ye Zhou, Jia-Xin Shi and Shi-Min Hu*
IEEE Transactions on Visualization and Computer Graphics (TVCG) 2016

Simultaneous Camera Path Optimization and Distraction Removal for Improving Amateur Video
**Fang-Lue Zhang,** Jue Wang, Han Zhao, Ralph R. Martin, Shi-Min Hu*
IEEE Transactions on Image Processing (TIP),2015

PatchTable: Efficient Patch Queries for Large Datasets and Applications
Connelly Barnes , **Fang-Lue Zhang,** Liming Lou, Xian Wu, Shi-Min Hu*
ACM Transactions on Graphics (SIGGRAPH), 2015

PatchNet: A Patch-based Image Representation for Interactive Library-driven Image Editing
Shi-Min Hu*, **Fang-Lue Zhang,** Miao Wang, Ralph R. Martin and Jue Wang
ACM Transactions on Graphics (SIGGRAPH Asia), 2013

Aesthetic Image Enhancement by Dependence-Aware Object Re-composition
**Fang-Lue Zhang,** Miao Wang, Shi-Min Hu*
IEEE Transactions on Multimedia (TMM), 2013,

ImageAdmixture: Putting Together Dissimilar Objects from Groups
**Fang-Lue Zhang,** Ming-Ming Cheng, Jiaya Jia, Shi-Min Hu*
IEEE Transactions on Visualization and Computer Graphics (TVCG), 2012, 18(11), 1849-1857.

RepFinder: Finding Approximately Repeated Scene Elements for Image Editing.
Ming-Ming Cheng, **Fang-Lue Zhang,** Niloy J. Mitra, Xiaolei Huang, Shi-Min Hu*
ACM Transactions on Graphics (SIGGRAPH 2010), 30(4), 98:1-8, 2010

Data-Driven Object Manipulation in Images
Chen Goldberg, Tao Chen, **Fang-Lue Zhang,** Ariel Shamir, Shi-Min Hu*

Computer Graphics Forum (Eurographics), 2012
*Shi-Min Hu is my supervisor at Tsinghua University

- **FELLOWSHIPS AND AWARDS**

Oct 2013        National Scholarship (Top 5%), Tsinghua University, China
Mar 2012        Excellent Phd Award received from IBM (3 in Tsinghua University)
May 2009        Outstanding Graduate Scholarship (Top 3%), Zhejiang University, China
2006-2008       First-class Scholarship in every year, Zhejiang University, China
**Team Award:**
July 2012        First-class Prize of Natural Science awarded by Ministry of Education of China

- **MAJOR COLLABORATIONS**

---Prof. Ralph Martin, image processing, professor, Cardiff University
---Dr. Jue Wang, image editing, principle researcher, Adobe Research
---Dr. Eli Shechtman, image and light field editing, senior researcher, Adobe Research
---Dr. Jiaya Jia, image processing, associate professor, The Chinese University of Hong Kong
---Dr. Connelly Barnes, image editing, assistant professor, University of Virginia
---Dr. Tao Chen, image processing, post doctor, Columbia University

- **ORGANISATION OF SCIENTIFIC MEETINGS**

Jun 2016                 Executive Committee
                         --Workshop on Smart Robotics 2016
Nov 2012, Apr 2015,      Organizing Assistant
                         --Conference of Computational Visual Media 2012, 2015
Jun 2011                 Organizing Assistant
                         --Tsinghua-Microsoft Graphics Day, Beijing

- **MEMBERSHIPS OF SCIENTIFIC SOCIETIES**

Jun 2010 – Now       Member, ACM
Oct 2010 – Now       Member, China Computer Federation
May 2011 – Now       Member, IEEE

- **ACADEMIC SERVICES**

**Journal Reviews:** ACM Trans. Graph, IEEE Trans. Image Processing, IEEE Trans. Visualization and Computer Graphics, Computer Graphics Forum, The Visual Computer.

**Conference Reviews:** SIGGRAPH 2013-2015, SIGGRAPH Asia 2012-2015, Pacific Graphics 2011-2014, CVM 2012-2016, CGI 2014.

- **PROFESSIONAL ACTIVITIES**

**Invited Talks:**
Inviter: MIRALab in University of Geneva
Title: "Structure-based Visual Media Processing"

Inviter: Microsoft Research Asia,

Title: "Structure-aware Object level image editing"
Conference: Tsinghua-Microsoft Graphics Day 2012

Inviter: Samsung Beijing Telecom Development
Title: "Photo Optimization and Enhancement"
Conference: Image Processing Technology Seminar 2013

**Exhibition:** China National Computer Congress 2011, Graphics Open Day in Tsinghua

**Oral Presentations:** SIGGRAPH 2015, SIGGRAPH Asia 2013, Pacific Graphics 2012

- **RESEARCH PROJECTS**

**Project leader:**
2015-Now: First-class Grant from the China Postdoctoral Science Foundation
　　　　　"Perception-based structure analysis and editing of video", **Principal Investigator.**
2013-2014: International Cooperative Research Project with Samsung :
　　　　　"Photo Re-composition by Object Layout Optimization"

**Project participant:**
2012-2014: National High Technology Research and Development Program of China (863)
　　　　　"Display, Interaction and Encoding Techniques for Wearable Devices"

2011-2013: Natural Science Foundation of China
　　　　　"Image and Video Content Editing Based on Objects Analysis"

2010-2012: Natural Science Foundation of China
　　　　　"Internet Video Retrieval and Composition"

2009-2014: National Basic Research Project of China (973):
　　　　　"Intelligent Processing of Internet Visual Media"

- **INDUSTRIAL WORK EXPERIENCE**

2013.4-2013.10: Development of research for commercialization with Tencent (China)
　　　　　　"Magic Pen"—Online image composition system

2011.6-2011.9:　Research Intern, Image Searching Team, Goso Company (China)
　　　　　　Fast Image De-duplication System Development

2010.4-2010.10: Cooperation on Software Development with MIST (Japan)
　　　　　　Sketch based Image Composition Tool for Windows

- **PATENTS**

- Shi-Min Hu, Fang-Lue Zhang, Miao-Wang, Image-enhancement based on dependency-aware object layout optimization, Chinese Patent, 201210455248.8

- Shi-Min Hu, Fang-Lue Zhang, Miao-Wang, PatchNet Representation for images and its construction method, Chinese Patent, 201310403210.0

- Shi-Min Hu, Fang-Lue Zhang, Ming-Ming Cheng, Image composition based on grouped elements mixing, Chinese Patent, 201110262737.7

- Shi-Min Hu, Ming-Ming Cheng, Fang-Lue Zhang, Repeated elements completion based on geometric information. Chinese Patent, 201010158440.1
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- **RESEARCH EXPERIENCE**

I have seven years of experience in computer graphics research. I am now a post-doctoral research associate in Tsinghua University. Before that, I obtained my PhD degree at the Visual

Media Lab at Tsinghua University, under the supervision of Prof. Shi-Min Hu, arguably the leading such lab in China. Tsinghua University is a top university in China (ranked 47th in the recent Times Higher Education world ranking).

I have substantial experience in intelligent image processing and editing research, including aesthetic-related image composition optimization, structure based image analysis, object-level image editing, library-driven image editing and multi-view image editing. I has also worked with leading companies to further develop research findings for commercialisation.

## Structure based image representation and analysis

I proposed "PatchNet", an efficient structure-aware image representation method. It is a compact, hierarchical representation describing structural and appearance characteristics of image regions. Contextual image matching performed using the PatchNet representation allows suitable regions to be found for image editing in a few seconds, even from a library containing thousands of images. The result was published in SIGGRAPH Asia 2013.

## Object-level image manipulation

Object-level operations are important in intelligent image editing. I proposed an "ImageAdmixture" tool to mix grouped-elements from different images, while preserving their original structure and appearance characteristics. I also contributed to another object-level image manipulation project "RepFinder" which considered completion of repeated elements when editing images, making use of boundary refinement methods. The results were published in SIGGRAPH 2010 and TVCG 2012.

## Aesthetic-related image and video optimization

This research concerns how to optimize photo and video content automatically by adjusting the layout of objects. I proposed a novel dependency analysis method to preserve the original semantic structure in the photo when modifying the layout of the foreground objects, and a video optimization method by detecting the visual distractions and re-planning the camera path to get a better video with a smoother path and avoid the distracting objects at the same time.

I also developed practical application software for smart phones in a cooperative project with Samsung. It is now being integrated into the newest system in smart phones of Samsung. The research findings were published in TMM 2013 and TIP 2015.

## Library-driven image editing

I proposed a library-driven image editing system using "PatchNets", which can turn a user sketch of an image into a compositing result in real-time. The result was published in SIGGRAPH Asia 2013. I contributed to a research project on data-driven object manipulation by creating its effective user interface, which was published in Eurographics 2012. I also was involved in two other library-driven image editing software commercial developments based on my research findings: "Magic Pen" with Tencent (China) and "Sketch-based Image Composition System" with MIST (Japan). The latter was exhibited at CNCC 2010.

## Patch-based multi-view image manipulation

Multi-view cameras, including stereo cameras and light-field cameras (e.g. Lytro) have significantly advanced and become wide spread in recent years, with a high potential to revolutionize photography. I proposed patch-based methods for interactively manipulating consumer plenoptic images, to achieve new light field editing effects that were not possible with existing techniques. These ideas can be potentially used in future multi-view image editing software. The research has been published in IEEE TVCG 2016.