

# SHENG GUO

**E-mail:** sheng.guo@siat.ac.cn, **Homepage:** <http://guoshengcv.github.io>, **Phone:** +86-13632821350

**Address:** Shenzhen Institutes of Advanced Technology

1068 Xueyuan Avenue, Shenzhen University Town, Shenzhen, P.R.China

## EDUCATION

---

**Shenzhen Institute of Advanced Technology, CAS**

*August 2013 - Present*

Ph.D. in Pattern Recognition and Intelligent System, Supervisor: Prof. Yu Qiao and Weilin Huang.

Thesis title: Analysis and Understanding of Complex Scenes.

**Changsha University Of Science and Technology, Changsha**

*September 2010 - June 2013*

M.Sc. in Applied Mathematics, Supervisor: Prof. Lanzhe Liu and Prof. Chuangxia Huang.

Thesis title: A thesis submitted in partial satisfaction of the Requirements for the degree of Master of Science.

**Beifang University of Nationalities, Yinchuan**

*September 2006 - June 2010*

B.Sc. in Information and Computing Sciences, Supervisor: Prof. Jimin Li.

Thesis title: Inequality and its application.

## RESEARCH INTERESTS

---

**Computer Vision:** Image Classification and Scene Recognition

**Machine Learning:** Representation, Deep learning.

**Applied Mathematics:** Harmonic Analysis.

## PUBLICATIONS

---

### Computer Science Papers

- **S. Guo**, W. Huang, and Y. Qiao, Locally-Supervised Deep Hybrid Model for Scene Recognition, in IEEE transactions on Image Processing (**TIP**) (to be submitted).
- **S. Guo**, W. Huang, and Y. Qiao, Local Color Contrastive Descriptor for Image Classification, in IEEE transactions on Multimedia (**TMM**) (Major Revision) .
- **S. Guo**, W. Huang, C. Xu, and Y. Qiao, F-divergence based Local Contrastive Descriptor for Image Classification, IEEE International Conference on Information Science and Technology (**ICIST**), 2014, (**IEEE ICIST Best Paper Award Finalists**).
- L. Wang, Z. Wang, **S. Guo**, and Y. Qiao, Better Exploiting OS-CNNs for Better Event Recognition in Images, ChaLearn Looking at People (LAP) workshop, ICCV, 2015.
- L. Wang, **S. Guo**, W. Huang, and Y. Qiao, Places205-VGGNet Models for Scene Recognition, ArXiv 1508.01667, 2015.

### Mathematics Papers

- C. Huang, **S. Guo**, and L. Liu, Boundedness on Morrey Space for Toeplitz Type Operator Associated to Singular Integral Operator with Variable Calderon-Zygmund Kernel, in Journal of Mathematical Inequalities, Vol. 8, No.3 2014.
- **S. Guo**, C. Huang, and L. Liu,  $M^k$ -Type Estimates for Multilinear Commutator of Singular Integral Operator with General Kernel, Acta Universitatis Apulensis, No. 33, 2013.

- **S. Guo**, C. Huang, and L. Liu, Boundedness for Multilinear Commutator of Singular Integral Operator with Weighted Lipschitz Functions, *Annals of the University of Craiova*, 40(1), 2013.
- **S. Guo**, C. Huang, and L. Liu, Continuity for Multilinear Commutator of Singular Integral Operator with General Kernel on Besov Spaces, *Annals of West University of Timisoara - Mathematics*, 51(1), 2013.
- **S. Guo**, C. Huang, and L. Liu, Sharp function estimates and boundedness for Toeplitz type operators associated to general integral operator, *Annals of the University of Craiova*, 39(1), 2012.
- **S. Guo**, C. Huang, and L. Liu, Sharp Maximal Function Estimates and Boundedness for Commutator Related to Generalized Fractional Integral Operator, *Analele Universitatii de Vest din Timisoara. Seria Matematica-Informatica*, 50(2), 2012.

## CONTESTS

---

- ChaLearn Looking at People Challenge: **3st place for cultural event recognition (ICCV2015)**.  
*2015*
- Large-scale Scene Understanding Challenge: **second follow Google Team(CVPR2015)**. *2015*
- First Audio and Video Competition: **3st places for person dection**. *2014*

## RESEARCH PROJECTS

---

**Multimedia Research Center , Shenzhen Institutes of Advanced Technology,CAS** *August 2013 - present*

### *Designing Locally-Supervised Deep Hybrid Model for Scene Recognition*

- we propose a novel Locally-Supervised Deep Hybrid Model (LS-DHM) that effectively enhances and employs the convolutional features of the CNN for scene recognition. Firstly, we notice that the convolutional features capture local objects and fine structures of scene images, which yield important cues for discriminating ambiguous scenes. Secondly, we propose a new local convolutional supervision (LCS) layer to enhance the local structure of the image by directly propagating the label information to the convolutional layers. Thirdly, we propose an efficient Fisher Convolutional Vector (FCV) that successfully rescues the orderless mid-level semantic information (e.g. objects and textures) for scene recognition.
- Both the FCV and FCfeatures are collaboratively employed in the LS-DHM representation, which achieves very promising performance.
- The LS-DHM obtains **83.75%** and **67.56%** accuracies respectively on the heavily benchmarked MIT Indoor67 and SUN397 datasets, advancing the stat-of-the-art substantially.

### *Trained New Deep Network Models on Places205 for Scene Recognition*

- We use convolutional neural network to learn deep scene features for scene recognition tasks, and establish new state-of-art performances on the scene-centric database called Places205, which has 205 scene categories and 2.5 millions of images with a category label.
- We design a new training strategy, and train four *VGGnet* models, namely *VGGnet – 11*, *VGGnet – 13*, *VGGnet – 16*, *VGGnet – 19* by using a multi-GPU extension of Caffe toolbox with high computational efficiency. Our trained models achieve **61.16%** top1 accuracy and **89.26%** top5 accuracy on the Places205 dataset, the state-of-the-art performance.

### *Applying Deep Networks for Detecting the Masked Terrorists from Video*

- We design an new networks for person detection, and the model trained by the whole picture. We don't need to locate the masked person on the image, that can reduce the complexity of work.
- Our model have a excellent performance on this task, we also use the methods to take part in the first audio and video competition and get 3st places for person dection.

### ***Design a Descriptor for Image Classification***

- We present a simple yet efficient local descriptor for image classification, referred as Local Color Contrastive Descriptor (LCCD), by leveraging the neural mechanisms of color contrast.nformation are linked inextricably in visual cortical processing.
- We propose a novel contrastive mechanism to compute the color contrast in both spatial location and multiple channels. The color contrast is computed by measuring f-divergence between the color distributions of two regions.
- Our descriptor enriches local image representation with both color and contrast information. We verified experimentally that it can compensate strongly for the shape based descriptor (e.g. SIFT), while keeping computationally simple.

### **Mathematics and Computational Science Institute., Changsha University of Science and Technology**

*June 2010 - June 2013*

- We mainly study the boundedness for the multilinear commutator related to the generalized singular integral operator and some locally integrable functions on  $R^n$ .
- We research the boundedness of the multilinear commutators  $T_{\vec{b}}$  generated by the generalized singular operator  $T$  and  $BMO$  functions or weighted *Lipschitz* functions in  $L_p(1 < p < \infty)$  spaces *Besov* space, we also study the certain generalized fractional integral operator.

### **HONORS AND AWARDS**

---

IEEE ICIST Best Paper Award Finalists,	<i>2014</i>
National Scholarship for Master Students (3 recipient in MS institute)	<i>2013</i>
Excellent Postgraduate	<i>2013</i>
Excellent Student Cadres	<i>2009</i>

### **REFERENCES**

- 
- Yu Qiao (yu.qiao@siat.ac.cn), Professor of Chinese Academy of Sciences.  
 Weilin Huang(wl.huang@siat.ac.cn), Assistant professor of Chinese Academy of Sciences.