

XIANG HUANG

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RESEARCH INTERESTS	Image Processing & Computational Photography: Image Based Rendering and Relighting, Intrinsic Images, Super-resolution, Coded Aperture Photography Computer Vision: Camera Calibration, 3D Geometry Machine Learning and Pattern Recognition	
EDUCATION	Northwestern University, USA Ph.D. Candidate in Computer Science Advisor: Prof. <i>Jack Tumblin</i>	<i>09/2006 - current</i> GPA: 3.98/4.0
	McMaster University, CANADA M.A.Sc. in Electrical Engineering Advisor: Prof. <i>Xiaolin Wu</i> Thesis: "Multiple Description Lattice Vector Quantization"	<i>01/2004 - 06/2006</i> GPA: 4.0/4.0
	Huazhong Univ. of Science & Technology, CHINA B.E. in Electronics & Information Engineering	<i>09/1999 - 06/2003</i> GPA: 93.6/100 , Rank: 1st/480
WORK EXPERIENCE	Nokia Research Lab, Hollywood RESEARCH INTERN (Advisor: Dr. <i>Gang Hua & Lance Williams</i>) ★ Shadow detection (ICCV'2011): <ul style="list-style-type: none">• proposed a new approach to detect shadow boundaries in images of outdoor scenes.• built a compact set of robust visual features from physical models of outdoor shadows.• detected shadow boundaries based on statistical learning (SVM) with these features. Advanced Technology Labs, Adobe Systems Inc. RESEARCH INTERN (Advisor: Dr. <i>Sunil Hadap</i>) ★ Intrinsic images (patent pending): We separated shading image and reflectance image from a single color image by optimization using novel constraints on image gradient.	SANTA MONICA, CA, USA <i>03/2010 - 06/2010</i> SAN JOSE, CA, USA <i>06/2009 - 08/2009</i>
	Department of EECS, Northwestern University RESEARCH ASSISTANT (Advisor: Prof. <i>Jack Tumblin</i>) ★ Image relighting (EI'2008): <ul style="list-style-type: none">• proposed a fast, low-cost technique to computationally remove ambient light from images of desktop sized objects lit from all directions.• computed deep shadow images for high quality image relighting. ★ Super-resolution by coded aperture (CVPR'2008): <ul style="list-style-type: none">• developed a simple and error-tolerant method to increase image resolution.• merged multiple images captured with different masks in front of the camera, which eliminated the need for sub-pixel camera movement or complicated image registration. ★ Coffee-table light-field camera(Ongoing): We design a light-field camera system that is able to simulate 'giant-aperture macro-photographs' that would otherwise require impractically huge lens to be produced. This coffee-table camera also enables us to selectively remove occlusion to 'see through' an object.	EVANSTON, IL, USA <i>09/2006 - current</i>

Department of ECE, McMaster University HAMILTON, ON, CANADA
RESEARCH ASSISTANT (Advisor: Prof. *Xiaolin Wu*) 01/2004 - 06/2006

★ **Multiple Description Coding (DCC'2006)**: We proposed an optimal linear-time index assignment algorithm for distributed source coding in packet lossy networks.

PATENTS Co-inventor with Dr. Sunil Hadap, "Separating Shading and Reflectance from a Single Color Image", US Patent pending, filed in 2010

SELECTED PUBLICATIONS

- **Xiang Huang**, Gang Hua, Jack Tumblin, and Lance Williams, "What Characterizes a Shadow Boundary under the Sun and Sky?", in *Proc. IEEE International Conf. on Computer Vision (ICCV'2011)*, Barcelona, Spain.
- Ankit Mohan, **Xiang Huang**, Ramesh Raskar, and Jack Tumblin, "Sensing Increased Image Resolution Using Aperture Masks", in *Proc. IEEE Conf. on Computer Vision and Pattern Recognition (CVPR'2008)*, Anchorage, Alaska, USA.
- **Xiang Huang**, Ankit Mohan and Jack Tumblin, "Deep Shadows in a Shallow Box", in *Proc. of SPIE Electronic Imaging Conf. (EI'2008)*, San Jose, USA.
- **Xiang Huang** and Xiaolin Wu, "Optimal Index Assignment for Multiple Description Lattice Vector Quantization", pp. 272-281, in *Proc. of IEEE Data Compression Conf. (DCC'06)*, 2006.
- **Xiang Huang** and Xiaolin Wu, "Optimal Design of Multiple Description Lattice Vector Quantizers", submitted to *IEEE Trans. on Inform. Theory*.

TEACHING EXPERIENCE Co-instructor and Co-designer of the course "Computational Photography What and How?" at Northwestern Univ. Spring '09
TA for several graphics and programming courses at Northwestern Univ. 2007-2012
Instructor of "Introduction to Computer Science" at Wuhan U. of Sci & Tech 2003
Instructor of "Computer Networks" at Huazhong U. of Sci & Tech 2003

HONORS AND AWARDS Alexander Graham Bell Canada NSERC Postgraduate Scholarship 2008-2010
Helen and Robert J. Piros Fellowship, Northwestern University 2007
Walter P. Murphy Fellowship, Northwestern University 2006
Outstanding Thesis Research, McMaster University 2006
Model of Outstanding Students, Huazhong U. of Sci & Tech (20 out of 30,000) 2001
Contests in Mathematics and Physics

- National Mathematical Contest in Modeling, China, Second Prize 2002
- National Olympic Physics Contest, China, First Prize 1998
- Provincial Olympic Mathematics Contest, Hunan, China, First Prize 1998
- National Olympic Mathematics Contest, China, Second Prize 1997

COMPUTER SKILLS Matlab, C, OpenGL, OpenCV, Python, AMPL

REFERENCES Prof. Jack Tumblin, Northwestern University. Others available upon request