

*Curriculum Vitae*

**Marshall Friend Tappen**

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**Education**

PhD in Electrical Engineering and Computer Science,  
Massachusetts Institute of Technology, Cambridge, MA, June 2006  
Thesis Title: *Learning Continuous Models for Estimating Intrinsic Component Images*

SM in Electrical Engineering and Computer Science,  
Massachusetts Institute of Technology, Cambridge, MA, 2002

BS in Computer Science with a minor in Mathematics,  
Brigham Young University, Provo, UT, 2000. Graduated Magna Cum Laude

**Academic Positions**

Assistant Professor, University of Central Florida (August 2006 – Present)

Graduate Research Assistant, MIT Computer Science and Artificial Intelligence  
Laboratory, (September 2000 – June 2006)

Supervised by Professors Edward Adelson and William Freeman.

Brigham Young University Computer Vision Laboratory, (Sept. 1998 - Aug. 2000)

Supervised by Professor William Barrett

**Industrial Positions**

Research Intern for Mitsubishi Electric Research Lab, Cambridge MA, (June 2001 -  
September 2001)

Intern for Hewlett-Packard Vancouver Printer Division, Vancouver, WA (1998)

## Teaching

Course Number	Course Title	Credits	Class	Semester	# of Students	Pctg of Students rating course as "Very Good" or "Excellent"
CAP 5415	Computer Vision	3	Grad	Fall 2006	21	76.47%
CAP 6412	Advanced Computer Vision	3	Grad	Spring 2007	20	93.34%
CAP 5415	Computer Vision	3	Grad	Fall 2007	12	90.90%
EEL5542	Random Processes	3	Grad	Spring 2008	36	83.00%
CAP 5415	Computer Vision	3	Grad	Fall 2008	22	71.43%
EEL5542	Random Processes	3	Grad	Fall 2008	32	73.33%
EEL5542	Random Processes	3	Grad	Spring 2009	21	87.50%
CAP 5415	Computer Vision	3	Grad	Fall 2009	21	84.61%
EEL5542	Random Processes	3	Grad	Fall 2009	16	90.09%
CAP 5415	Computer Vision	3	Grad	Fall 2010	30	100.00%
EEL5542	Random Processes	3	Grad	Fall 2010	28	84.62%
COP 3223	C Programming	3	Under-grad	Spring 2011	183	64.05%

## Supervision

### Graduate PhD Students:

**Paul Scovanner** – Graduated Summer 2011

### Visiting Scholar

Hosted Prof. Hongjing Peng from the Nanjing University of Technology in 2009

### Post-Doctoral Scholars

**Jiejie Zhu** – Worked on detecting shadows, January 2009- January 2011.

**Jian Sun** – Worked on real-time image enhancement, August 2009 – March 2010.

### PhD Students:

**Syed Zain Massood** – Began working with me in Spring 2007. Has passed qualifying exams and is preparing to complete the candidacy exam. Anticipated Graduation: Spring 2012

**Muhammad Nazar Khan** – Began working with me in Spring 2008. Has published a paper and is working on research focus for proposal. Anticipated Graduation: Spring 2012

**Hakan Boyraz** – Began working with me in Spring 2008. Pursuing PhD on a part-time basis. Has published a paper.

**Zhongkai Han** – Began in Fall 2010. Preparing paper for submission.

**Feresteh Sadeghi** – Began in Fall 2010

### Masters

**Adarsh Nagaraja** – Graduated Summer 2011

**Brendan Moore** – Co-advised with Hassan Foroosh. Graduated in Fall 2007.

**Craig Dean** – Graduated in Spring 2008 (Non-thesis M.S. degree)

## Research

**Key Words:** *Computer Vision, Machine Learning, Image Processing*

### **Book Chapters**

M. F. Tappen, “Learning Parameters in Continuous-Valued Markov Random Fields”, in *Markov Random Fields for Vision and Image Processing*, edited by Andrew Blake, Pushmeet Kohli, and Carsten Rother. MIT Press 2011

### **Journal Publications**

#### **In Revision:**

M. F. Tappen, “Fundamental Strategies for Solving Low-Level Vision Problems.” *In Submission to IPSJ Transactions on Computer Vision and Applications*. Accepted pending minor revisions that have been submitted and are awaiting approval.

P. Scovanner and M. F. Tappen, “Pedestrian Path Prediction with Multiple Behavior Models”. *In Submission to IEEE Transactions on Pattern Analysis and Machine Intelligence*. In revision after initial round of reviews

#### **In Submission:**

J. Zhu, S.Z Masood, and M. F. Tappen, “Learning-based Shadow Recognition and Removal from Monochromatic Natural Images.” *In Submission to IEEE Transactions on Pattern Analysis and Machine Intelligence*

#### **Published:**

S. Z. Masood\*, J. Zhu, and M. F. Tappen, “Automatic Correction of Saturated Regions in Photographs using Cross-Channel Correlation,” *Computer Graphics Forum*, Vol. 28, October 2009, 1861-1869

R. S. Szeliski, R. Zabih, D. Scharstein, O. Veksler, V. Kolmogorov, A. Agarwala, M. Tappen, and C. Rother. “A Comparative Study of Energy Minimization Methods for Markov Random Fields” *In IEEE Transactions on Pattern Analysis and Machine Intelligence*, Volume 30, Number 6, June 2008 pp 1068-1080

M. F. Tappen, W. T. Freeman, and E. H. Adelson. “Recovering Intrinsic Images from a Single Image”. *In IEEE Transactions on Pattern Analysis and Machine Intelligence*, Volume 27, Issue 9, September 2005, Pages 1459 – 147

## ***Peer-Reviewed Conference Publications***

**CVPR and ICCV are top conferences in computer vision, with an acceptance rate around 24%. They have an impact similar to or greater than top journals.**

**An \* besides a name denotes a student or post-doc author.**

### **2011**

M. F. Tappen, “Recovering Shape from a Single Image of a Mirrored Surface from Curvature Constraints”. Appeared in the *2011 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR 2011)*, pages 2545 – 2552 (**Acceptance Rate: 26.4%**)

J. Sun and M. F. Tappen, “Learning Non-Local Range Markov Random Field for Image Restoration”. Appeared the *2011 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR 2011)*, pages 2745-2752, Colorado Springs, CO, June 2011 (**Acceptance Rate: 26.4%**)

H. Boyraz\*, M. F. Tappen, and R. Sukthankar, “Localizing Actions through Sequential 2D Video Projections.” In *CVPR4HB 2011 : Fourth IEEE Workshop on CVPR for Human Communicative Behavior Analysis (CVPR 2011 Workshop)* (**Acceptance Rate: 26.4%**)

S. Masood\*, C. Ellis\*, M. F. Tappen, J. J. LaViola, and R. Sukthankar, “Measuring and Reducing Observational Latency when Recognizing Actions.” To appear in the *6th IEEE Workshop on Human Computer Interaction: Real-Time Vision Aspects of Natural User Interfaces (ICCV 2011 Workshop)* (**Acceptance Rate: 33%**)

S. Masood\*, M. Khan\*, A. Nagaraja\*, and M. F Tappen, “Correcting Cuboid Corruption For Action Recognition In Complex Environment.” To Appear in the *3rd IEEE Workshop on Video Event Categorization, Tagging and Retrieval for Real-World Applications (ICCV 2011 Workshop)*

### **2010**

K. Tang\*, M. F. Tappen, R. Sukthankar, and C. Lampert, “Optimizing One-Shot Recognition with Micro-Set Learning”. Appeared in the *2010 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR 2010)*, pages 3027-3034, San Francisco, CA, June 2010 (**Acceptance Rate: 23%**)

J. Zhu\* , K. G. G. Samuel\* , S. Masood\* , and M. F. Tappen, “Learning to Recognize Shadows in Monochromatic Natural Images”. Appeared in the *2010 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR 2010)*, pages 223-230, San Francisco, CA, June 2010 (**Acceptance Rate: 23%**)

J. Sun\* and M. F. Tappen, “Context-Constrained Hallucination for Image Super-Resolution.” Appeared in the *2010 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR 2010)*, pages 231-238, San Francisco, CA, June 2010 (**Acceptance Rate: 23%**)

## 2009

P. Scovanner\* and M.F. Tappen, “Learning Pedestrian Dynamics from the Real World”, *Proceedings of the 2009 International Conference on Computer Vision (ICCV09)*, pages 381-388, Kyoto, Japan, October 2009, **(Acceptance Rate: 23%)**

N. Khan\* , M.F. Tappen and L. Tran, “Training Many-Parameter Shape-from-Shading Models Using a Surface Database”, *Proceedings of the 2009 IEEE International Workshop on 3-D Digital Imaging and Modeling*, pages 1433-1440, Kyoto Japan, October 2009

K. G. G. Samuel\* and M.F. Tappen, “Learning Optimized MAP Estimates in Continuously-Valued MRF Models”. *The Proceedings of the 2009 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR)*, pages 477 – 484, Miami Beach, USA, June 2009 **(Acceptance Rate: 26%)**

## 2008

Marshall F. Tappen, Kegan G. G. Samuel\*, Craig V. Dean\* and David M. Lyle\*. “The Logistic Random Field -- A Convenient Graphical Model for Learning Parameters for MRF-based Labeling” *In the 2008 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR)* **(Accepted for Oral Presentation, Acceptance Rate 4%)**

Brendan Moore\*, Marshall Tappen, and Hassan Foroosh. “Learning Face Appearance under Different Lighting Conditions ” *In The Second IEEE International Conference on Biometrics: Theory, Applications, and Systems*.

## 2007

M. F. Tappen. “Utilizing Variational Optimization to Learn Markov Random Fields”. *In The 2007 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR)* **(Acceptance Rate 27.5%)**

M.F. Tappen, C. Liu, E. H. Adelson, and W. T. Freeman. “Learning Gaussian Conditional Random Fields for Low-Level Vision”. *In The 2007 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR)* **(Acceptance Rate 27.5%)**

## Previous Years (Before Coming to UCF)

M.F. Tappen, E. H. Adelson, and W. T. Freeman. “Estimating Intrinsic Component Images using Non-Linear Regression”. *The Proceedings of the 2006 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR)*, Volume 2, Pages 1992-1999, 2006 **(Acceptance Rate: 28.1%)**

R. S. Szeliski, R. Zabih, D. Scharstein, O. Veksler, V. Kolmogorov, A. Agarwala, M. Tappen, and C. Rother. "A Comparative Study of Energy Minimization Methods for Markov Random Fields". In *Seventh European Conference on Computer Vision (ECCV 2002)*, volume~2, pages 16-29, Graz, May 2006. Springer-Verlag.  
**(Accepted for Oral Presentation, Acceptance Rate: 4.4%)**

M.F. Tappen, B. C. Russell, and W. T. Freeman. "Efficient Graphical Models for Processing Images". *The Proceedings of the 2004 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR)*, Volume 2, Pages 673 – 680, 2004  
**(Acceptance Rate: 20%)**

M. F. Tappen and W. T. Freeman. "Comparison of Graph Cuts with Belief Propagation for Stereo, using Identical MRF Parameters". In *Proceedings of the Ninth IEEE International Conference on Computer Vision (ICCV)*, Pages 900 - 907, 2003  
**(Acceptance Rate: 20.7%)**

M. F. Tappen, B. C. Russell, and W. T. Freeman. "Exploiting the Sparse Derivative Prior for Super-Resolution and Image Demosaicing". In *Third International Workshop on Statistical and Computational Theories of Vision at ICCV 2003*, 2003

M. F. Tappen, W. T. Freeman, and E. H. Adelson. "Recovering Intrinsic Images from a Single Image". In S. T. S. Becker and K. Obermayer, editors, *Advances in Neural Information Processing Systems 15*, pages 1343-1350. MIT Press, Cambridge, MA, 2003.

## ***Invited Talks***

### **2011**

Invited to give talk at Sharp Labs in Camas, WA. in October 2011, Title to be determined

### **2010**

“Modeling Images for Low-Level Vision and Image Enhancement,” October 2010, Keynote address at the 2010 IEEE International Conference on Intelligent Computing and Intelligent Systems (ICIS) in Xiamen China

“Progress on Super-resolution/ Learning Models of Pedestrian Behavior”, April 2010, Microsoft Research Asia

“One-Shot Learning/ Learning Models of Pedestrian Behavior”, April 2010, University of Miami Department of Electrical Engineering

### **2009**

“Data and Algorithms for Estimating Scene Causes from Images,” October 2009, Talk presented at GEOINT 2009, a national conference on geo-spatial intelligence.

### **Previous Years**

“Discriminative Approaches for Learning Parameters in Continuous-Valued Markov Random Field” - Microsoft Research Workshop on Markov Random Fields in Computer Vision, Oct. 11<sup>th</sup>, 2008, Cambridge, England.

“Learning to Estimate Intrinsic Images”, Presented at Williams College, March 2006, Brigham Young University, March 2006 and University of Central Florida, March 2006

“Building a Markov Random Field for Super-Resolution”, Presented at a Brigham Young University Computer Science Colloquium, November 2004

## ***Patents Filed***

Marshall Tappen and Jiejie Zhu, *Systems and Methods For Automatically Identifying Shadows in Images*, Application # 61416049, Filed November 22, 2010

## **Funding**

### ***Funded***

#### **2009**

*ARRA HCC: Medium: Collaborative Research: Computer Vision and Online Communities: A Symbiosis*. Role: co-PI, in collaboration with Todd Zickler (Harvard) and Trevor Darrell (Berkeley). Credit: 100% Funded by the National Science Foundation for 2009-2013 for \$399,149.00 total.

*REU Site: Research Experience for Undergraduates in Computer Vision*, Role: Co-PI, Credit 33%. Submitted in collaboration with Prof. M. Shah (PI) and Prof. N. Lobo. Role: Senior Personnel, Credit: 33%. Funded by the National Science Foundation. Project: 2009-2012, Initial funding for 2009:\$100,000.

*Automatic Target Recognition for Personnel Imaging Systems*, Role: PI, Credit: 100%, Funded for 2009-2010 for \$127,107. Additional I-4 match:\$42,369 Funded by Department of Homeland Security under a sub-contract from Applied Research Associates.

*RI: Small: Learning-Based Systems for Single-Image Photometric Reconstruction* Role: PI, Credit: 100%. Funded by the National Science Foundation for 2009-2012 for \$363,005.

#### **2008**

*Data and Algorithms for Estimating Scene Causes from Real-World Images*, Funded by the National Geo-Spatial Intelligence Agency. Role:PI, Credit:100% Funded for \$296,696 for 2008-2010.

*RAOS: TO#16 - Technical Consulting in Support of High Performance Computing Applications in Adversarial Reasoning*. Role: PI, Credit 100%, Funded by RDECOM for 2008-2009 for \$26,757.

## Professional Activities

Served as Local Arrangements Chair for IEEE CVPR 2009

Program Committees:

- IEEE ICCV 2007, 2009, 2011
- IEEE CVPR 2006-2011
- ECCV (European Conference on Computer Vision) 2008, 2010

Reviewer for:

- IEEE Transactions on Pattern Analysis and Machine Intelligence
- Neural Information Processing Systems (NIPS) 2008, 2009, 2010
- ACM Transactions on Graphics
- SIGGRAPH 2006
- SIGGRAPH Asia 2011
- NSF IIS Review Panel 2009, 2011

PhD Thesis Committees:

**Imran Junejo** (Chair: H. Foroosh, Graduated 2007)  
**Saad Ali** (Chair: M. Shah, Graduated 2008)  
**Saad M. Khan** (Chair: M. Shah, Graduated 2008)  
**Mark Colbert** (Chair: C. Hughes, Graduated 2008)  
**Yuping Shen** (Chair: H. Foroosh, Graduated 2009)  
**Cyrus Hillsman** (Chair: Yan Wang, Industrial Engineering, Graduated 2009)  
**Imran Saleemi** (Chair: M. Shah, Graduated 2011)  
**Ramin Mehran** (Chair: M. Shah)  
**Jared Johnson** (Chair: C. Hughes)

## Honors and Awards

Teaching Incentive Program Award (2011)

UCF Millionaire's Club, awarded for raising over \$1,000,000 in external grants in FY 2009 (2009)

Department of Defense NDSEG Graduate Fellowship (2001)

NSF Graduate Research Fellowship Honorable Mention (2001)