Dr. Junlan (Julia) Yang

Computer Vision Researcher, San Francisco Bay Area
julia.jyang@gmail.com
www.linkedin.com/in/julia-yang-5a12817/

Research Interests

Computer Vision and Computational Photography

3D reconstruction, segmentation and matting, image refocusing, HDR imaging, video stabilization, video super-resolution

Education

Ph.D. in **Electrical Engineering** 08/2005 - 05/2010
University of Illinois, Chicago

Dissertation: "Virtual Video Enhancement for Mobile Cameras: Stabilization, Auto-Focus and Super-resolution", GPA: 4.0/4.0

B.S. in **Information Engineering** 09/2001-06/2005
Zhejiang University, China

Working Experience

Research Scientist 02/2011 - Present
Marseille Inc., Santa Clara, CA

- Investigate and prototype computer vision algorithms for company's next generation products.
- Worked as key researcher in developing company's current real-time video processors.
- Deliver algorithms from mathematical models to fixed-point C++ prototype.
- Participate in patents and technology communications for both inside and outside of company.

Senior Software Engineer 12/2009 - 12/2010
iKoa Corporation, Menlo Park, CA

- Developed software algorithms for stereo vision.

Research Intern 05/2009 - 08/2009, 05/2008 - 08/2008
Sharp Laboratories of America, Camas, WA

- Conducted research on video de-blurring and de-noising.
- Filed two patents and both granted. Published one book chapter and one conference paper.

Research Intern 05/2007 - 08/2007
Ricoh Innovations Inc., Menlo Park, CA

- Conducted research on computational photography.
- Filed two patents and granted one.

Research Assistant 08/2005 - 11/2009
University of Illinois at Chicago, Multimedia Communications Laboratory

- Completed Ph.D. research with Prof. Dan Schonfeld, on computer vision and video enhancement.
- Published two transaction papers and five conference papers.

Research Highlights

Object Segmentation and Matting 2016-2017

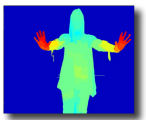
- On-going research on accurate detection and segmentation of specific objects.

mCable Gaming: Graphics Post-rendering Enhancement 2013-2016

- Invented and implemented a new anti-aliasing algorithm based on local and global image understanding. It strikes a balance between removing pixelation and preserving texture details.
- Product released on 2017 and received positive feedback from gaming community.

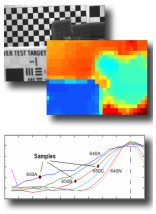
mCable: Intelligent Pixel Quality Enhancer 2011-2014

- Developed key video enhancement technologies including noise and compression artifact reduction, color processing and resolution enhancement. Fused different enhancements together based on per-pixel contextual analysis.
- Product released in 2015 and passed Technicolor's 4K Image Certification program.



Stereo Cameras 2009-2010

- Implemented accurate depth sensing based on stereo correspondence and graph cut.
- Extended the functionality to high dynamic range (HDR) imaging and post-capture focus editing.

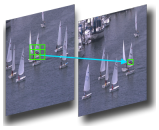


Depth from Defocus and Multi-frame Reconstruction 2007-2009

- Implemented estimation for defocus levels and object depths from multiple frames using imaging model and image filter banks.
- Proposed an adaptive image acquisition process whose parameters are optimized by image processing predictors. Achieved multi-frame reconstruction for all-in-focus image.
- For fixed-focus video application, utilized the blur level differences caused by object and camera motion to estimate object depth and reconstruct focused image.

Video Stabilization 2005-2009

- Proposed a complete system for stabilizing jittered video sequences resulting from unsteady hand or moving platforms.
- Used particle filters to track camera motion parameters. Explored efficient sampling scheme based on SIFT features.



Video Deblurring and Denoising 2008-2009

- Invented a novel image regularization term based on Non-Local-Means. It suppresses performance of classic bilateral filter and Total Variation (TV) regularization.
- Improved denoising by tracking pixel motion through temporal dimension.

Patents

System and Method to Enhance and Process a Digital Image, *US 9,202,267*
J. Yang, E. Fisch, *Marseille Networks, Inc.*

Motion-compensated Temporal Filtering based on Variable Filter Parameters, *US 9,036,695*
J. Yang, Y. Su, C. A. Segall, *Sharp Laboratories of America, Inc.*

Methods and Systems for Imaging Processing, *US 8,331,714*
P. J. L. van Beek, **J. Yang**, *Sharp Laboratories of America, Inc.*

Adaptive Image Acquisition for Multiframe Reconstruction, *US 9,438,816*
M. D. Robinson, **J. Yang**, D. G. Stork, *Ricoh Company, Ltd.*

Adaptive Image Acquisition and Display using Multi-focal Display, *pending*
M. D. Robinson, **J. Yang**, D. G. Stork, W. Wu, P. Llull, I. Tosic, K. Berkner, N. Bedard, *Ricoh Company, Ltd.*

PUBLICATIONS

Video Stabilization

Robust Video Stabilization Based on Particle Filter Tracking of Projected Camera Motion
J. Yang, D. Schonfeld, M. Mohamed [PDF]
IEEE Transactions on Circuits and Systems for Video Technology, 2009. [130 citations]

Online Video Stabilization Based on Particle Filter
J. Yang, D. Schonfeld, C. Chen, M. Mohamed [PDF]
IEEE International Conference on Image Processing (ICIP), 2006. [56 citations]

Depth from Defocus

Robust Focused Image Estimation from Multiple Images in Video Sequences
J. Yang, D. Schonfeld, M. Mohamed [PDF]
IEEE International Conference on Image Processing (ICIP), 2007. [Best Student Paper Award]

Virtual Focus and Depth Estimation from Defocused Video Sequences
J. Yang, D. Schonfeld [PDF]
IEEE Transactions on Image Processing, 2010. [impact factor: 3.725]

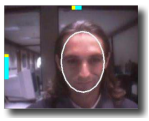
Focused Video Estimation from Defocused Video Sequences
J. Yang, D. Schonfeld, M. Mohamed [PDF]
SPIE Proceedings of Electronic Imaging, 2008. [Oral]

Non-Local Means Denoising and Deblurring

Image Denoising and Restoration based on Non-Local Means
P. van Beek, Y. Su, **J. Yang**
Chapter in "Image Restoration: Fundamentals and Advances", CRC Press, 2012.

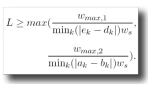
Image Deblurring and Denoising with Non-local Regularization Constraint
P. van Beek, **J. Yang**, S. Yamamoto, Y. Ueda [PDF]
SPIE Proceedings of Electronic Imaging, 2010. [Oral]

Pose Estimation



Pose Estimation from Video Sequences Based on Sylvester's Equation
C. Chen, D. Schonfeld, **J. Yang**, M. Mohamed [PDF]
SPIE Proceedings of Electronic Imaging, 2007. [Oral]

Super-Resolution



New Results on Performance Analysis of Super-Resolution Image Reconstruction
J. Yang, D. Schonfeld [PDF]
IEEE International Conference on Image Processing (ICIP), 2009. [Oral]

Awards and Honors

IBM Student Paper Award, International Conference on Image Processing, 2007.

Student Travel Award, UIC Graduate College, 2006, 2007.

Outstanding Graduating Senior, Zhejiang University, 2005.

Best Student Dissertation Award, Zhejiang University, 2005.

University Scholarship, Zhejiang University, 2004, 2003, 2002.

Professional Services

Reviewer for Journals and Conferences

- IEEE Transactions on Image Processing, Transactions on Circuits and Systems for Video Technology, Transactions on Multimedia, Transactions on Fuzzy Systems, IEEE Signal Processing Letters, Journal of Electronic Imaging, Imaging Science Journal, Journal of Imaging Science and Technology, Journal of Computing and Informatics, Visual Computer Journal.
- IEEE International Conference in Image Processing, International Conference on Multimedia and Expo, International Conference on Connected Vehicles and Expo, International Symposium on Circuits and Systems.

IEEE Local Chapter

- Project coordinator in IEEE Signal Processing Society, Chicago Chapter, 2009.

Teaching Assistant

- Image Analysis and Computer Vision II, UIC, 2009
- Electrical Circuit Analysis, UIC, 2009
- Image Analysis and Computer Vision I, UIC, 2008
- Network Analysis, UIC, 2008

Technical Skills

Programming

- C/C++: fluent (Windows/Linux, $\sim$8 years)
- Matlab: fluent ($\sim$6 years)
- Other: CUDA (1 year), Shell script (frequent use), Python (beginner)

Visual Editing

- Adobe Photoshop, Illustrator, Premiere, Cyberlink Power Director.