

Quan Wang

Curriculum Vitae

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Software Engineer
Google Inc.
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Research Interests

- Biomedical image analysis (mainly 2D and 3D segmentation)
- Geometric models, shape models, and face models
- Occupancy sensing and reconstruction for smart lighting
- Deep learning and speech recognition
- Speaker identification and hotword detection
- Learning-based font slicing

Education

- 2010/08 – 2014/10, **Ph.D., Rensselaer Polytechnic Institute**, NY, USA
Signal Analysis and Machine Perception Laboratory (SAMPL)
Department of Electrical, Computer, and Systems Engineering (ECSE)
Advisor: **Prof. Kim L. Boyer**
Thesis: Exploiting Geometric and Spatial Constraints for Vision and Lighting Applications
GPA: 4.0/4.0
- 2006/08 – 2010/08, **B.Eng.** in Automation, **Tsinghua University**, Beijing, China
Department of Automation, Class of Fundamental Sciences
Advisor: **Prof. Qionghai Dai**
Thesis: Implementation and Study of Light-Field-Based 3D Object Retrieval System
Major GPA: 91.3/100

Work Experience

- 2015/11 – Current, *Software Engineer*, **Google**, New York City, NY, USA
 - Manager: **Ignacio Lopez Moreno**
 - "Ok Google" voice search & actions, speaker identification
- 2014/11 – 2015/10, *Machine Learning Scientist*, **Amazon**, Cambridge, MA, USA
 - Manager: **Dr. Shiv Vitaladevuni**
 - Amazon Firefly: Optical character recognition
 - Amazon Echo: Speech recognition
- 2013/05 – 2013/08, *Research Intern*, **IBM Almaden Research Center**, San Jose, CA, USA
 - Manager: **Dr. Tanveer Syeda-Mahmood**

- Automated segmentation and heart disease detection from echocardiogram images
- The Medical Sieve project (in Java)
- 2012/05 – 2012/08, *Research Intern*, **Siemens Corporate Research**, Princeton, NJ, USA
 - Manager: **Dr. Dijia Wu** and **Dr. Shaohua Kevin Zhou**
 - Learning-based automatic knee cartilage segmentation in 3D MR images (in C++)
- 2009/06 – 2009/07, *Intern Programmer*, **Northking Technology Corporation**, Beijing, China
 - The development of the Business Operation System of Northking Technology Corporation (with JSF framework)

Awards

- The **Allen B. Dumont Prize**, 2015
 - This prize is awarded to a graduate student who has demonstrated high scholastic ability and has made a substantial contribution to that field.

Journal Publications

- **Quan Wang**, Kim L. Boyer, “The active geometric shape model: A new robust deformable shape model and its applications”, *Computer Vision and Image Understanding*, Volume 116, Issue 12, December 2012, Pages 1178-1194, ISSN 1077-3142, doi:10.1016/j.cviu.2012.08.004.
- **Quan Wang**, Xinchu Zhang, Kim L. Boyer, “Occupancy distribution estimation for smart light delivery with perturbation-modulated light sensing”, *Journal of Solid State Lighting* 2014 1:17, ISSN 2196-1107, doi:10.1186/s40539-014-0017-2.

Conference Publications

- **Quan Wang**, Xinchu Zhang, Kim L. Boyer, “3D Scene Estimation with Perturbation-Modulated Light and Distributed Sensors”, *10th IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS)*. **(ORAL)**
- **Quan Wang**, Yan Ou, A. Agung Julius, Kim L. Boyer and Min Jun Kim, “Tracking Tetrahymena Pyriformis Cells using Decision Trees”, *21st International Conference on Pattern Recognition (ICPR)*, Pages 1843-1847, 11-15 Nov. 2012.
- **Quan Wang**, Dijia Wu, Le Lu, Meizhu Liu, Kim L. Boyer, and Shaohua Kevin Zhou, “Semantic Context Forests for Learning-Based Knee Cartilage Segmentation in 3D MR Images”, *MICCAI 2013: Workshop on Medical Computer Vision*. **(ORAL)**
- **Quan Wang**, Xin Shen, Meng Wang, Kim L. Boyer, “Label Consistent Fisher Vectors for Supervised Feature Aggregation”, *22nd International Conference on Pattern Recognition (ICPR)*, 2014.

- **Quan Wang**, Xinchu Zhang, Meng Wang, Kim L. Boyer, “Learning Room Occupancy Patterns from Sparsely Recovered Light Transport Models”, *22nd International Conference on Pattern Recognition (ICPR)*, 2014. **(ORAL)**
- **Quan Wang**, Kim L. Boyer, “Feature Learning by Multidimensional Scaling and its Applications in Object Recognition”, *26th SIBGRAP Conference on Graphics, Patterns and Images (Sibgrapi)*. IEEE, 2013. **(ORAL)**
- Tanveer Syeda-Mahmood, **Quan Wang**, Patrick McNeillie, David Beymer, Colin Compas, “Discriminating Normal and Abnormal Left Ventricular Shapes in Four-Chamber View 2D Echocardiography”, *International Symposium on Biomedical Imaging (ISBI)*, 2014.
- **Quan Wang**, Yu Wang, Zuoguan Wang, “Online Smart Face Morphing Engine with Prior Constraints and Local Geometry Preservation”, *International Workshop on Multimodal pattern recognition of social signals in human computer interaction (MPRSS 2014)*. **(ORAL)**
- Xinchu Zhang, **Quan Wang**, Kim L. Boyer, “Illumination Adaptation with Rapid-Response Color Sensors”, *SPIE Optical Engineering + Applications*, 2014. **(ORAL)**

Technical Reports and Theses

- **Quan Wang** (2012), “GMM-Based Hidden Markov Random Field for Color Image and 3D Volume Segmentation”, *arXiv:1212.4527 [cs.CV]*.
- **Quan Wang** (2012), “HMRF-EM-image: Implementation of the Hidden Markov Random Field Model and its Expectation-Maximization Algorithm”, *arXiv:1207.3510 [cs.CV]*.
- **Quan Wang** (2012), “Kernel Principal Component Analysis and its Applications in Face Recognition and Active Shape Models”, *arXiv:1207.3538 [cs.CV]*.
- **Quan Wang** (2014), “Exploiting Geometric and Spatial Constraints for Vision and Lighting Applications”, Rensselaer Polytechnic Institute Ph.D. dissertation.
- **Quan Wang** (2010), “Implementation and Study of Light-Field-Based 3D Object Retrieval System”, Tsinghua University Undergraduate Thesis.
 - Project demo video: <https://www.youtube.com/watch?v=cqpDEDbjTL8>

Patents

- **Quan Wang**, Dijia Wu, Meizhu Liu, Le Lu, Kevin Shaohua Zhou, “[Automatic spatial context based multi-object segmentation in 3D images](#)”, Pub. No.: US9218524 B2, Granted Dec. 22, 2015
- David Beymer, Patrick McNeillie, Tanveer Syeda-Mahmood, **Quan Wang**, “[Discriminating between normal and abnormal left ventricles in echocardiography](#)”, Application No.: US 14/262780, Filed Apr. 27, 2014

- **Quan Wang**, Xinchu Zhang, Kim L. Boyer, “Occupancy sensing smart lighting systems”, Application No.: US 62/014745, Filed June 20, 2014
- Thibaud Senechal , **Quan Wang**, etc., “Text detection using features associated with neighboring glyph pairs”, Filed Sep. 1, 2015
- **Quan Wang**, Ignacio Lopez Moreno, Li Wang, “Speaker Verification”

Reviewing

- SIBGRAPI Conference on Graphics, Patterns, and Images 2013
- SIBGRAPI Conference on Graphics, Patterns, and Images 2014
- VISAPP International Conference on Computer Vision Theory and Applications 2014
- EURASIP Journal on Image and Video Processing
- Computer Communication & Collaboration
- Artificial Intelligence Review

Teaching

- 2011/01 – 2012/12, *Teaching Assistant*, **Rensselaer Polytechnic Institute**, Troy NY, USA
 - Spring 2011, Embedded Control [ENGR 2350], by *Prof. Russell P. Kraft*
 - Spring 2011, Real-Time Applications in Control & Communications [ECSE 4760], by *Prof. Russell P. Kraft*
 - Fall 2011, Introduction to Engineering Analysis [ENGR 1100], by *Prof. Mark W. Olles*
 - Spring 2012, Electric Circuits [ECSE 2010], by *Prof. Jeffrey Braunstein*
 - Spring 2012, Biological Image Analysis [ECSE 4960], by *Dr. Jens Rittscher and Dr. Dirk Padfield*
 - Fall 2012, Modeling and Analysis of Uncertainty [ENGR 2600], by *Prof. Charles J. Malmborg*

Media Coverage

- HighBeam Research news about my work on AGSM
 - <https://www.highbeam.com/doc/1G1-313059756.html>
- HighBeam Research news about my patent on Semantic Context Forests
 - <https://www.highbeam.com/doc/1P3-3332903311.html>
- Issues in Computer Engineering: 2013 Edition article about my work on AGSM
 - <https://books.google.com/books?id=TuamoWYw9gMC&pg=PA194>
- Technology Org article about my work on COSBOS
 - <http://www.technology.org/2015/12/02/team-invents-occupancy-sensing-with-distributed-photodiodes/>
- One News Page article about my work on COSBOS
 - <http://www.onenewspage.com/n/Press+Releases/755d9z1t9/Researchers-from-Rensselaer-built-smart-lighting-systems-using.htm>

Projects and Websites

- **AGSM: Active Geometric Shape Models**
 - Official project wiki site with source code: <https://sites.google.com/site/agsmwiki/>
 - Demo video: <https://www.youtube.com/watch?v=c6Vto4VN5GA>

- **COSBOS: COlor-Sensor-Based Occupancy Sensing**
 - Official project wiki site: <https://sites.google.com/site/cosboswiki/>
 - Video: <https://www.youtube.com/watch?v=Gby3XJEJ7H8>

- **My MATLAB Central**
 - Website: <http://www.mathworks.com/matlabcentral/fileexchange/authors/130634>
 - 20,000+ downloads in total