

# OLGA VEKSLER

Computer Science Department

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## 1 Education

Degree	University	Department	Year
B.A. magna cum laude	New York University	Mathematics and Computer Science	1995
M.Sc.	Cornell University	Computer Science	1999
Ph.D.	Cornell University	Computer Science	1999

## 2 Employment History

Date	Position	Department	Institution
2009-present	Associate Professor	Computer Science	University of Western Ontario
2003-2009	Assistant Professor	Computer Science	University of Western Ontario
1999-2003	Scientist	Computer Science	NEC Research Institute

## 3 Honors and Awards

- Early Researcher Award (ERA), Ministry of Research and Innovation, 2009
- NSF/GEE Fellowship, 1996-1998
- Diploma with honors in Mathematics and with honors in Computer Science from New York University
- 1995 Math Prize, New York University
- 1994 Math Prize, New York University

## 4 Publications

### 4.1 Book Chapters

1. H. Ishikawa, O. Veksler, "Convex and Truncated Convex Priors for Multi-label MRFs", in *Advances in Markov Random Fields for Vision and Image Processing* by editors A. Blake, P. Kohli and C. Rother, MIT Press, to appear.
2. Y. Boykov, O. Veksler, and R. Zabih "Optimizing Multi-Label MRFs by Move Making Algorithms", in *Advances in Markov Random Fields for Vision and Image Processing* by editors A. Blake, P. Kohli, C. Rother, MIT Press, to appear.

3. R. Szeliski, R. Zabih, D. Scharstein, O. Veksler, V. Kolmogorov, A. Agarwala, M. Tappen, C. Rother, “A Comparative Study of Energy Minimization Methods for MRFs”, in *Advances in Markov Random Fields for Vision and Image Processing* by editors A. Blake, P. Kohli, C. Rother, MIT Press, to appear.
4. Y. Boykov and O. Veksler, “Graph Cuts in Vision and Graphics: Theory and Applications”, in *Mathematical Models of Computer Vision: The Handbook* by editors N.Paragios, Y.Chen, O.Faugeras, pp. 79-96, Springer-Verlag, 2005. **Citation count: 18.**

## 4.2 Refereed Journals

1. M. P. Kumar, O. Veksler, P. Torr, “Improved Moves for Truncated Convex Models”, accepted to *Journal of Machine Learning Research*.
2. Y. Liu, O. Veksler, O. Juan, “Simulating Classic Mosaics with Graph Cuts”, vol. 29, no. 8, pp. 23872399, 2010 *Computer Graphics Forum*.
3. X. Liu, O. Veksler, J. Samarabandu, “Graph Cut Optimization with Ordering Constraints on Labels”, to appear in *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*.
4. P. Das, O. Veksler, V. Zavadsky, Y. Boykov, “Semiautomatic Segmentation with Compact Shape Prior”, invited to special issue of *Image and Vision Computing Journal*, vol. 27, no.1-2, pp. 206-219. Top 15 papers from CRV’2006 conference got invited to this special issue. **Citation count: 6.**
5. R. Szeliski, R.Zabih, D. Scharstein, O. Veksler, V. Kolmogorov, A. Agarwala, M. Tappen, C. Rother, “A Comparative Study of Energy Minimization Methods for Markov Random Fields”, *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, vol. 30, no. 6, pp. 1068-1080, 2008.
6. O. Veksler, “Stereo Correspondence with Compact Windows via Minimum Ratio Cycle”, in *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, vol. 24, no.12, pp. 1654-1660, 2002. **Citation count: 40.**
7. O. Veksler, “Dense Features for Semi-Dense Stereo Correspondence”, *International Journal of Computer Vision (IJCV)*, vol. 47, no.1-3, pp. 247-260, 2002. **Citation count: 20.**
8. Y. Boykov, O. Veksler, R. Zabih, “Fast Approximate Energy Minimization via Graph Cuts”, in *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, vol. 23, no. 11, pp. 1222-1239, 2001. **Citation count: 1516.**
9. Y. Boykov, O. Veksler, R. Zabih, “A Variable Window Approach to Early Vision”, in *IEEE Transactions on Pattern Analysis Machine Intelligence (TPAMI)*, vol. 20, no. 12, pp. 1283-1294, 1998. **Citation count: 63.**

### 4.3 Refereed Conference Proceedings

1. V. Vakili, O. Veksler, "Object Class Segmentation using Reliable Regions", in *Asian Conference on Computer Vision (ACCV)*, 14 pages, 2010. Acceptance rate: 29.1% (215/739 )
2. P. Mehrani, O. Veksler, "Saliency Segmentation based on Learning and Graph Cut Refinement", in *British Machine Vision conference (BMVC)*, 12 pages, 2010. Acceptance rate for oral presentation: 8.6% (30/345)
3. O. Veksler, Y. Boykov, P. Mehrani, "Superpixels and Supervoxels in an Energy Optimization Framework", in *European Conference on Computer Vision (ECCV)*, 14 pages, 2010. Acceptance rate 27.4% (322/1174)
4. P.F. Felzenszwalb, O. Veksler, "Tiered Scene Labelling with Dynamic Programming", in *IEEE Computer Vision and Pattern Recognition (CVPR)*, 8 pages, 2010. Acceptance rate for oral presentation 4.5% (78/1733).
5. Y. Liu, O. Veksler, "Animated Classic Mosaics from Video", in *International Symposium on Advances in Visual Computing (ISVC)*, (2) 2009, pp. 1085-1096
6. O. Veksler, "Multi-label Moves for MRFs with Truncated Convex Priors", in *7th International Conference on Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR)*, pp. 1-13, 2009. Acceptance rate for oral presentation: 24% (18/75).
7. O. Veksler, "Star Shape Prior for Graph-Cut Image Segmentation", in *European Conference on Computer Vision (ECCV)*, vol. 3, pp. 454-467, 2008. Acceptance rate: 27.9% (243/871). **Citation count: 8.**
8. B. Peng, O. Veksler, "Parameter Selection for Graph Cut Based Image Segmentation", in *British Machine Vision conference (BMVC)*. Acceptance rate: 48% (123/256). **Citation count: 3.**
9. X. Liu, O. Veksler, J. Samarabandu, "Graph Cut with Ordering Constraints on Labels and its Applications", in *IEEE Computer Vision and Pattern Recognition (CVPR)*, pages 1-8. Acceptance rate: 31% (508/1593). **Citation count: 9.**
10. Y. Liu, O. Veksler, O. Juan, "Simulating Classic Mosaics with Graph Cuts", in *6th International Conference on Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR)*, pp. 55-70. Acceptance rate for oral presentation: 15.7% (22/140). **Citation count: 3.**
11. O. Veksler, "Graph Cut Based Optimization for MRFs with Truncated Convex Priors", in *IEEE Computer Vision and Pattern Recognition (CVPR)*, pp. 1-8, electronic edition, 2007. Acceptance rate: 28.1% (351/1250). **Citation count: 23.**
12. O. Veksler, "Reducing Search Space for Stereo Correspondence with Graph Cuts", in *British Machine Vision conference* vol. 2, pp. 709-719, 2006. Acceptance rate: 28.4% (127/447). **Citation count: 4.**

13. P. Das, O. Veksler, V. Zavadsky, Y. Boykov, "Semiautomatic Segmentation with Compact Shape Prior", in *Canadian Conference on Computer and Robot Vision*, pp. 28-36, 2006. Acceptance rate for oral presentation: 35% (35/110). **Citation count: 3**
14. P.Das, O. Veksler, V. Zavadsky, Y. Boykov, "Semiautomatic Segmentation of Transistor Gates in Integrated Chips", in *2nd Workshop on Applications of Computer Vision, in Conjunction with 9th European Conference on Computer Vision*, pp. 14-22, 2006.
15. R. Szeliski, R.Zabih, D. Scharstein, O. Veksler, V. Kolmogorov, A. Agarwala, M. Tappen, C. Rother, "A Comparative Study of Energy Minimization Methods for Markov Random Fields", in *European Conference on Computer Vision(ECCV)*, vol. 2, pp. 16-29, 2006. Acceptance rate for oral presentation: 4.4% (40/900). **Citation count: 182.**
16. O. Veksler, "Stereo Correspondence by Dynamic Programming Tree", in *IEEE Computer Vision and Pattern Recognition (CVPR)*, vol. 2, pp. 384-390, 2005. Acceptance rate for oral presentation: 6.5% (74/1160). **Citation count: 53.**
17. O. Veksler, "Extracting Dense Features for Visual Correspondence with Graph Cuts", in *IEEE Computer Vision and Pattern Recognition (CVPR)*, vol. 1, pp. 689-694, 2003. Acceptance rate 23.1% (209/905). **Citation count: 13.**
18. O. Veksler, "Fast Variable Window for Stereo Correspondence using Integral Images", in *IEEE Computer Vision and Pattern Recognition(CVPR)*, vol. 1, pp. 556-561, 2003. Acceptance rate for oral presentation 6.6% (149/905). **Citation count: 108.**
19. O. Veksler, "Semi-Dense Stereo Correspondence with Dense Features", in *IEEE Computer Vision and Pattern Recognition (CVPR)*, vol. 2, pp. 490-497, 2001. Acceptance rate: 30% (273/920). **Citation count: 9.**
20. O. Veksler, "Semi-Dense Stereo Correspondence with Dense Features", in *IEEE Workshop on Stereo and Multi-Baseline Vision*, pp. 149-157, 2001.
21. O. Veksler, "Stereo Matching by Compact Windows via Minimum Ratio Cycle", in *IEEE International Conference on Computer Vision(ICCv)*, vol. 1, pp. 540-547, 2001. Acceptance rate: 34%. **Citation count: 45.**
22. O. Veksler, "Image Segmentation by Nested Cuts", in *IEEE Computer Vision and Pattern Recognition(CVPR)*, pp. 339-344, 2000. Acceptance rate for oral presentation: 14.2% (66/466). **Citation count: 53.**
23. Y. Boykov, O. Veksler, R. Zabih, "Fast Approximate Energy Minimization via Graph Cuts", in *IEEE International Conference on Computer Vision(ICCv)*, pp.377-384, 1999. Acceptance rate: 31%.
24. Y. Boykov, O. Veksler, R. Zabih, "A New Algorithm for Energy Minimization with Discontinuities", in *IEEE International Workshop on Energy Minimization Methods in Computer Vision*, pp.205-220, 1999. **Citation count: 19.**

25. Y. Boykov, O. Veksler, R. Zabih, "Markov Random Fields with Efficient Approximations", in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, pp. 648-655, 1998. Acceptance rate for oral presentation: 9% (42/453). **Citation count: 283.**
26. Y. Boykov, O. Veksler, R. Zabih, "Disparity Component Matching for Visual Correspondence", in *IEEE Conference Computer Vision and Pattern Recognition(CVPR)*, pp. 470-475, 1997. Acceptance rate: 32% (173/544). **Citation count: 22.**

## 5 Invited Talks

1. "Optimization for Pixel Labelling Problems with Structured Layout", TELECOM ParisTech, Paris, France, 2011
2. "Optimization for Pixel Labelling Problems with Structured Layout", University Pierre et Marie Curie, Paris, France, 2010
3. "Optimization for Pixel Labelling Problems with Structured Layout", University College London, London, UK, 2010
4. "Optimization for Pixel Labelling Problems with Structured Layout", Willow (cole Normale Superiure/INRIA), Paris, France, 2010
5. "Optimization for Pixel Labelling Problems with Structured Layout", ESIEE, Paris, France, 2010
6. "Optimization for Pixel Labelling Problems with Structured Layout", Oxford University, Oxford, UK, 2010
7. "Optimization for Pixel Labelling Problems with Structured Layout", Graphical Models workshop, Heidelberg University, Germany, 2010
8. "Optimization for Pixel Labelling Problems with Structured Layout", Technical University of Munich, Germany, 2010
9. "Approximate Scene Geometry From a Single View through Learning and Optimization", Steklov Institute of Mathematics, St. Petersburg, Russia, 2010
10. "Optimization for Pixel Labelling Problems with Structured Layout", York University, Toronto, Canada, 2010
11. "Generating Classic Mosaics Automatically with Graph Cuts", Microsoft MRF Workshop, University of Cambridge, UK, 2008
12. "Multi-Label Moves for Multi-Label Energies", University of Pennsylvania, 2008.
13. "Multi-Label Moves for Multi-Label Energies", Workshop on Graph Cuts and Related Discrete or Continuous Optimization Problems, Institute for Pure and Applied Mathematics (IPAM), Los Angeles, 2008.

14. “Simulating Classic Mosaics with Graph Cuts”, Moscow State University, 2007.
15. “Graph Algorithms in Computer Vision”, University of Toronto, 2005.
16. “Graph Algorithms in Computer Vision”, University of Western Ontario, 2003.
17. “Graph Algorithms in Computer Vision”, University of Michigan at Ann Arbor, 2003.
18. “Compact Windows for Visual Correspondence via Minimum Ratio Cycle Algorithm”, AL-LADIN Workshop on Graph Partitioning in Vision and Machine Learning, Carnegie Mellon University, Pittsburgh, 2003.
19. “Graph Algorithms in Computer Vision”, Dartmouth College 2003.
20. “Graph Algorithms for Stereo Correspondence”, Princeton University 2002.
21. “Graph Algorithms for Stereo Correspondence”, University of Chicago, 2002.
22. “Graph Algorithms for Stereo Correspondence”, Massachusetts institute of Technology, 2002.
23. “Graph Algorithms for Stereo Correspondence”, Brown University, 2002.
24. “Graph Algorithms for Stereo Correspondence”, University of Wisconsin-Madison, 2002.
25. “Graph Algorithms for Stereo Correspondence”, Michigan State University, 2002.
26. “Labeling Problem in image processing”, New York University medical center, 2002.
27. “Fast Energy Minimization for Computer Vision via Graph Cuts”, DIMACS Workshop on Graph Theoretic Methods in Computer Vision, Rutgers, New Jersey, 1999.
28. “Fast Energy Minimization for Computer Vision via Graph Cuts”, NEC Research Institute, Princeton, 1999.

## 6 Research Funding

1. Early Researcher award, “Image Based 3D Modeling from Multiple Cameras”, \$140,000 for a period of five years, 2009.
2. NSERC discovery grant, “Discrete optimization methods and their applications in computer vision”, \$26,000 per year for a period of five years, 2007-2012.
3. Grant from Semiconductor Insights, \$7,000, for a period of one year, 2006.
4. CFI/MEDT new opportunities grant, “Laboratory for Image-based 3D Modelling Technologies”, co-pi, total amount is \$436,792, my part is \$218,396 lump sum, 2006. Co-pi Yuri Boykov.
5. NSERC discovery grant, “Parameter estimation in graph cut based optimization methods”, \$23,500 per year for a period of three years, 2004-2007.
6. UWO, start up grant, \$50,000 to cover a period of three years, 2003-2006.

## 7 Software

1. Software for superpixel segmentation in C++, available from <http://www.csd.uwo.ca/faculty/olga/code.html>
2. I have developed software for graph-cuts based energy minimization in C++, available from my website: <http://www.csd.uwo.ca/faculty/olga/code.html>. Most of the methods this software implements were developed by me and my co-authors. I regularly get questions and bug reports about it, which means my software is regularly being used.

## 8 Patents

1. R. Zabih, Y. Boykov, O. Veksler, “System and method for fast approximate energy minimization via graph cuts”, United States Patent 6,744,923, June 1, 2004. Microsoft Research has obtained non-exclusive rights to this patent in July 2005. Google has obtained non-exclusive rights to this patent in December 2006.

## 9 Professional Activities

### 9.1 Conference Organization

1. Area Chair, *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2011.
2. Area Chair, *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2010.
3. Co-Organizer of *6th IEEE Computer Society Workshop on Perceptual Organization in Computer Vision*, in conjunction with *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2008.

### 9.2 Conference Program Committees

1. Program Committee *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)* 2000, 2003-2009. Reviewing load is, on average, 14 papers per year.
2. Program Committee *International Conference on Computer Vision (ICCV)* 2001, 2003, 2005, 2007, 2009. Reviewing load is, on average, 14 papers per year.
3. Program Committee *European Conference on Computer Vision (ECCV)* 2006, 2008, 2010. Reviewing load is, on average, 12 papers per year.
4. Program Committee *Canadian Conference on Computer and Robot Vision* 2004-2010. Reviewing load is, on average, 3 papers per year.
5. Program Committee *International Conference on Pattern Recognition (ICPR)* 2006, 2008. Reviewing load is, on average, 13 papers per year.
6. Program Committee *GraphiCon* 2008. Reviewing load was 6 papers.

7. Program Committee *IEEE Second workshop Towards Benchmarking Automated Calibration, Orientation, and Surface Reconstruction from Images* 2007. Reviewing load was 2 papers.

### **9.3 Journal Article and Grant Reviewing**

1. *IEEE Transactions on Pattern Analysis Machine Intelligence* (**TPAMI**)
2. *International Journal of Computer Vision* (**IJCV**)
3. *Computer Vision and Image Understanding*
4. *IEEE Transactions on Image Processing*
5. *International Journal of Robotics Research*
6. *Israel Science Foundation*