

# Curriculum Vitae

## Sven J. Dickinson

Department of Computer Science, University of Toronto  
6 King's College Rd., Toronto, Ontario, Canada M5S 3G4  
TEL: (416) 978-3853, FAX: (416) 978-1455  
email: sven@cs.toronto.edu, url: www.cs.toronto.edu/~sven  
citizenship: Canada/USA

## Research Interests

Object recognition, including shape modeling, indexing, and matching; qualitative shape description and generic object recognition; image and shape abstraction, learning structural descriptions from examples; graph algorithms for indexing and matching hierarchical structures; recovery and tracking of 2-D and 3-D deformable models; integration of vision and language; vision-based navigation; applications of computer vision to space robotics, content-based image retrieval, and robotic aids for the disabled.

## Education

- Ph.D. Computer Science, University of Maryland at College Park, 1991. Thesis topic: The Recovery and Recognition of Three-Dimensional Objects using Part-Based Aspect Matching (co-supervisors: Azriel Rosenfeld (UMD) and Alex Pentland (MIT)).
- M.Sc. Computer Science, University of Maryland at College Park, 1988. Master's project: An Expert Vision System for Autonomous Land Vehicle Road Following (supervisor: Larry Davis).
- B.A.Sc., Systems Design Engineering, University of Waterloo, Canada, 1983.

## Academic Positions

- **Acting Chair**, Department of Computer Science, University of Toronto, 2008–2009.
- **Professor**, Department of Computer Science, University of Toronto, 2007–present.
- **Vice Chair**, Department of Computer Science, University of Toronto, 2003–2006.
- **Associate Professor**, Department of Computer Science, University of Toronto, 2000–2007.
- **Assistant Professor**, Department of Computer Science, Rutgers University, 1995–2001.
- **Member**, Center for Discrete Mathematics and Theoretical Computer Science (DIMACS), Rutgers University, 1998–2001.
- **Joint Faculty Appointment**, Rutgers Center for Cognitive Science (RuCCS), Rutgers University, 1995–2001.
- **Assistant Research Professor**, Rutgers Center for Cognitive Science (RuCCS), Rutgers University, 1994–1995.
- **Research Associate**, Department of Computer Science, University of Toronto, 1991–1994.

- **Research Assistant**, Computer Vision Laboratory, Center for Automation Research, University of Maryland, 1985–1991.

### Visiting/Adjunct Positions

- **Adjunct Member**, Center for Vision Research, York University, 2001–present.
- **Visiting Assistant Professor**, Computer Vision Laboratory, Center for Automation Research, University of Maryland, 1994–1997.
- **Visiting Assistant Professor**, Department of Computer Science, University of Toronto, 1994–1996.
- **Assistant Research Scientist**, Computer Vision Laboratory, Center for Automation Research, University of Maryland, 1993–1994.
- **Visiting Scientist**, Vision and Modeling Group, Media Laboratory, Massachusetts Institute of Technology, 1992–1994.

### Industrial/Consulting Positions

- **Consultant and Member, Board of Advisors** (content-based image retrieval), Idée, Inc., Toronto, Ontario, 2003–present.
- **Software Engineer** (optical character recognition), DEST Corporation, Milpitas, CA, 1984–1985.
- **Software Engineer** (image processing), Grinnell Systems, San Jose, CA, 1983–1984.
- **Consultant** (machine vision), Data Images, Inc., Ottawa, Ont., Canada, 1982–1983.

### Awards

- **Dean’s Excellence Award**, Faculty of Arts and Science, University of Toronto, 2009.
- **Outstanding Reviewer Award**, European Conference on Computer Vision (ECCV), 2008, Marseille. (22 reviewers from 291 were chosen to receive the award)
- **Computer Science Student Union (CSSU) Teaching Award**, University of Toronto, 2007–2008.
- **Outstanding Reviewer Award**, International Conference on Computer Vision (ICCV), 2007, Rio de Janeiro. (23 reviewers from over 700 were chosen to receive the award)
- **Computer Science Student Union (CSSU) Teaching Award**, University of Toronto, 2006–2007.
- **Dean’s Excellence Award**, Faculty of Arts and Science, University of Toronto, 2006.
- **Outstanding Reviewer Award**, International Conference on Computer Vision (ICCV), 2005, Beijing. (10 reviewers from over 150 were chosen to receive the award)
- **Dean’s Excellence Award**, Faculty of Arts and Science, University of Toronto, 2005.

- **Dean’s Excellence Award**, Faculty of Arts and Science, University of Toronto, 2004.
- **Dean’s Excellence Award**, Faculty of Arts and Science, University of Toronto, 2003.
- **C.Y.O’Connor Fellowship**, School of Computer Science, Curtin University, Australia, 2002. This visiting fellowship, awarded to only one individual a year, is awarded to eminent scientists from around the world to further the development of science in Western Australia (where I spend part of my sabbatical).
- **Premiere’s Research Excellence Award (PREA)**, Ministry of Research and Innovation, Province of Ontario, 2002.
- **Dean’s Excellence Award**, Faculty of Arts and Science, University of Toronto, 2002.
- **Faculty Early Career Development (CAREER) Award**, National Science Foundation, 1996.
- **First Class Honors and Dean’s List Honors**, University of Waterloo, 1983.
- **Second Prize**, Ontario Engineering Design Competition (OEDC), Entrepreneurial Design Category, 1983, topic: Computer Vision System for the Automatic Inspection of Liquid Crystal Displays.

## Publications

### Refereed Journals

1. A. Levinshtein, A. Stere, K. Kutulakos, D. Fleet, S. Dickinson, and K. Siddiqi, “TurboPixels: Fast Superpixels using Geometric Flows”, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, Vol. 31, No. 12, December 2009, pp 2290–2297.
2. M. Jamieson, A. Fazly, S. Stevenson, S. Dickinson, and S. Wachsmuth, “Using Language to Learn Structured Appearance Models for Image Annotation”, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, to appear.
3. F. Demirci, A. Shokoufandeh, and S. Dickinson, “Skeletal Shape Abstraction from Examples”, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, Vol. 31, No. 5, May 2009, pp 944–952.
4. F. Demirci, B. Platel, A. Shokoufandeh, L. Florack, and S. Dickinson, “The Representation and Matching of Images using Top Points”, *Journal of Mathematical Imaging and Vision (JMIV)*, Vol. 35, No. 2, 2009, pp 103–116.
5. J. Novatnack, N. Cornea, A. Shokoufandeh, D. Silver, S. Dickinson, P. Kantor, and B. Bai, “A Generalized Family of Fixed-Radius Distribution-Based Distance Measures for Content-Based fMRI Image Retrieval”, *Pattern Recognition Letters*, Volume 29, 2008, pp 261–275.
6. K. Siddiqi, J. Zhang, D. Macrini, A. Shokoufandeh, S. Bouix, R. Chen, and S. Dickinson, “Retrieving Articulated 3-D Models Using medial Surfaces”, *Machine Vision and Applications (MVA)*, Volume 19, Number 4, July 2008, pp 261–275.
7. A. Shokoufandeh, L. Bretzner, D. Macrini, M.F. Demirci, C. Jönsson, and S. Dickinson, “The Representation and Matching of Categorical Shape”, *Computer Vision and Image Understanding (CVIU)*, Volume 103, Number 2, August 2006, pp 139–154.

8. M. F. Demirci, A. Shokoufandeh, Y. Keselman, L. Bretzner, and S. Dickinson, “Object Recognition as Many-to-Many Feature Matching”, *International Journal of Computer Vision (IJCV)*, Volume 69, Number 2, August 2006, pp 203–222.
9. J. Maclean, D. Chung, and S. Dickinson, “Integrating Region and Boundary Information for Improved Spatial Coherence in Object Tracking”, *Image and Vision Computing (IVC)*, Volume 24, 2006, pp 680–692.
10. P. Sala, R. Sim, A. Shokoufandeh, and S. Dickinson, “Landmark Selection for Vision-Based Navigation”, *IEEE Transactions on Robotics and Automation*, Vol. 22, No. 2, April 2006, pp 334–349.
11. Y. Keselman and S. Dickinson, “Generic Model Abstraction from Examples”, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, Volume 27, Number 7, special issue on Syntactic and Structural Pattern Recognition, July 2005, pp 1141–1156.
12. A. Shokoufandeh, D. Macrini, S. Dickinson, K. Siddiqi, and S. Zucker, “Indexing Hierarchical Structures using Graph Spectra”, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, Volume 27, Number 7, special issue on Syntactic and Structural Pattern Recognition, July 2005, pp 1125–1140.
13. C. Sminchisescu, D. Metaxas, and S. Dickinson, “Incremental Model-Based Estimation Using Geometric Consistency Constraints”, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, Volume 27, Number 5, May 2005, pp 727–738.
14. S. Dickinson, M. Pelillo, and R. Zabih, “Introduction to the Special Section on Graph Algorithms in Computer Vision”, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, Volume 23, Number 10, October 2001, pp 1049–1052.
15. S. Dickinson, D. Wilkes, and J. Tsotsos, “A Computational Model of View Degeneracy”, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, Volume 21, Number 8, 1999, pp 673–689.
16. K. Siddiqi, A. Shokoufandeh, S. Dickinson, and S. Zucker, “Shock Graphs and Shape Matching”, *International Journal of Computer Vision (IJCV)*, Volume 30, 1999, pp 1–24.
17. A. Shokoufandeh, I. Marsic, and S. Dickinson, “View-Based Object Recognition Using Saliency Maps”, *Image and Vision Computing (IVC)*, Volume 17, 1999, pp 445–460.
18. J. Tsotsos, G. Verghese, S. Dickinson, M. Jenkin, A. Jepson, E. Milios, F. Nufflo, S. Stevenson, M. Black, D. Metaxas, S. Culhane, Y. Ye, and R. Mann, “PLAYBOT: A Visually-Guided Robot to Assist Physically Disabled Children in Play”, *Image and Vision Computing (IVC)*, special issue on Vision for the Disabled, Vol. 16, 1998, pp 275–292.
19. S. Dickinson, H. Christensen, J. Tsotsos, and G. Olofsson, “Active Object Recognition Integrating Attention and Viewpoint Control”, *Computer Vision and Image Understanding (CVIU)*, Vol. 67, No. 3, September 1997, pp 239–260.
20. S. Dickinson, R. Bergevin, I. Biederman, J.-O. Eklundh, A. Jain, R. Munck-Fairwood, and A. Pentland, “Panel Report: The Potential of Geons for Generic 3-D Object Recognition”, *Image and Vision Computing (IVC)*, Vol. 15, No. 4, April 1997, pp 277–292.

21. S. Dickinson, D. Metaxas, and A. Pentland, “The Role of Model-Based Segmentation in the Recovery of Volumetric Parts from Range Data”, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, Vol. 19, No. 3, March 1997, pp 259–267.
22. S. Dickinson and D. Metaxas, “Using Aspect Graphs to Control the Recovery and Tracking of Deformable Models”, *International Journal of Pattern Recognition and Artificial Intelligence (IJPRAI)*, Vol. 11, No. 1, February 1997, pp 115–142. (special issue containing selected papers from the Workshop on Spatial Computing: Representation, Interpretation and Applications, Curtin University of Technology, Perth, Western Australia, December 2–3, 1995.)
23. E. Rivlin, S. Dickinson, and A. Rosenfeld, “Recognition by Functional Parts”, *Computer Vision and Image Understanding (CVIU)*, special issue on function-based object recognition, Vol. 62, No. 2, September 1995, pp 164–176.
24. S. Dickinson and D. Metaxas, “Integrating Qualitative and Quantitative Shape Recovery”, *International Journal of Computer Vision (IJCV)*, Vol. 13, No. 3, 1994, pp 1–20.
25. S. Dickinson, A. Pentland, and A. Rosenfeld, “From Volumes to Views: An Approach to 3-D Object Recognition” *Computer Vision, Graphics, and Image Processing: Image Understanding (CVIU)*, special issue on CAD-Based vision, Vol. 55, No. 2, March 1992, pp 130–154.
26. S. Dickinson, A. Pentland, and A. Rosenfeld, “3-D Shape Recovery using Distributed Aspect Matching”, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, special issue on Interpretation of 3-D Scenes, Vol. 14, No. 2, February 1992, pp 174–198.
27. S. Dickinson and L. Davis, “A Flexible Tool for Prototyping ALV Road Following Algorithms”, *IEEE Journal of Robotics and Automation*, Vol. 6, No. 2, April 1990, pp 232–242.

### Edited Books

28. S. Dickinson, A. Leonardis, B. Schiele, and M. Tarr, (eds.), “Object Categorization: Computer and Human Vision Perspectives”, Cambridge University Press, 2009.

### Invited Book Chapters

29. S. Dickinson, “The Evolution of Object Categorization and the Challenge of Image Abstraction”, in: S. Dickinson, B. Schiele, and M. Tarr, (eds), “Object Categorization: Computer and Human Vision Perspectives”, Cambridge University Press, 2009, pp 1–37.
30. K. Siddiqi, J. Zhang, D. Macrini, S. Dickinson, and A. Shokoufandeh, “3-D Model Retrieval Using Medial Surfaces”, in: *Medial Representations: Mathematics, Algorithms and Applications*, Kaleem Siddiqi and Stephen Pizer, editors, Kluwer, Boston, 2009, pp 309–326.
31. S. Dickinson, “Object Representation and Recognition”, in: E. Lepore and Z. Pylyshyn (eds.), *What is Cognitive Science?*, Basil Blackwell publishers, 1999, pp 172–207.
32. S. Dickinson and D. Metaxas, “Using Aspect Graphs to Control the Recovery and Tracking of 3-D Models”, in: T. Caelli, P. Lam, and H. Bunke (eds.), *Spatial Computing: Issues in Vision, Multimedia and Visualization Technologies*, Series in Machine Perception and Artificial Intelligence, World Scientific Publishing Co., Singapore, 1997, pp 115–142.

33. S. Dickinson and D. Metaxas, “Integrating Qualitative and Quantitative Object Representations in the Recovery and Tracking of 3-D Shape”, in: L. Harris and M. Jenkin (eds.), *Computational and Psychophysical Mechanisms of Visual Coding*, Cambridge University Press, New York, NY, 1997, pp 221–248.
34. S. Dickinson, “Part-Based Modeling and Qualitative Recognition”, in: A. Jain and P. Flynn (eds.), *Three-Dimensional Object Recognition Systems*, Advances in Image Communication and Machine Vision Series, Elsevier Science Publishers, Amsterdam, 1993, pp 201–228.
35. L. Davis, D. DeMenthon, S. Dickinson, and P. Veatch, “Algorithms for Road Navigation”, in: I. Masaki (ed.), *Vision-Based Navigation*, Springer-Verlag, New York, 1992, pp 83–110.
36. S. Dickinson, A. Pentland, and A. Rosenfeld, “A Representation for Qualitative 3-D Object Recognition Integrating Object-Centered and Viewer-Centered Models”, in: K. Leibovic (ed.), *Vision: A Convergence of Disciplines*, Springer Verlag, New York, 1990, pp 398–421.

### **Rigorously Refereed Conference and Workshop Proceedings**

37. A. Levinshtein, C. Sminchisescu, and S. Dickinson, “Multiscale Symmetric Part Detection and Grouping”, International Conference on Computer Vision (ICCV), Kyoto, Japan, September 2009.
38. D. Macrini, K. Siddiqi, and S. Dickinson, “From Skeletons to Bone Graphs: Medial Abstraction for Object Recognition”, Proceedings, IEEE Conference on Computer Vision and Pattern Recognition, Anchorage, Alaska, June 2008.
39. M. Jamieson, A. Fazly, S. Dickinson, S. Stevenson, and S. Wachsmuth, “Learning Structured Appearance Models from Captioned Images of Cluttered Scenes”, Proceedings, IEEE International Conference on Computer Vision (ICCV), Rio de Janeiro, October 2007.
40. M. van Eede, D. Macrini, A. Telea, C. Sminchisescu, and S. Dickinson, “Canonical Skeletons for Shape Matching”, Proceedings, International Conference on Pattern Recognition (ICPR), Hong Kong, August 2006.
41. M. Jamieson, S. Dickinson, S. Stevenson, and S. Wachsmuth, “Using Language to Drive the Perceptual Grouping of Local Features”, Proceedings, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), New York, June 2006, pp 2102–2109.
42. A. Levinshtein, C. Sminchisescu, and S. Dickinson, “Learning Hierarchical Shape Models from Examples”, Proceedings, International Workshop on Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR), St. Augustine, FL, November 2005, pp 251–267.
43. J. Zhang, K. Siddiqi, D. Macrini, A. Shokoufandeh, and S. Dickinson, “Retrieving Articulated 3-D Models Using Medial Surfaces and their Graph Spectra”, Proceedings, International Workshop on Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR), St. Augustine, FL, November 2005, pp 285–300.
44. N. Cornea, M. F. Demirci, D. Silver, A. Shokoufandeh, S. Dickinson, and P. Kantor, “3D Object Retrieval using Many-to-many Matching of Curve Skeletons”, Proceedings, The International Conference on Shape Modeling and Applications (SMI), MIT, June 2005, pp 368–373.

45. B. Platel, M. F. Demirci, A. Shokoufandeh, L. M. J. Florack, F. M. W. Kanters and S. J. Dickinson, “Discrete Representation of Top Points via Scale-Space Tessellation”, Proceedings, 5th International Conference on Scale Space and PDE Methods in Computer Vision, Hofgeismar, Germany, April 2005, pp 73–84.
46. P. Sala, R. Sim, A. Shokoufandeh, and S. Dickinson, “Landmark Selection for Vision-Based Navigation”, Proceedings, International Conference on Intelligent Robots and Systems (IROS), Sendai, Japan, September 2004, pp 3131–3138.
47. T. Denton, M. Demirci, J. Abrahamson, A. Shokoufandeh, and S. Dickinson, “Selecting Canonical Views for View-Based 3-D Object Recognition”, International Conference on Pattern Recognition (ICPR), Cambridge, U.K., August 2004, Vol. 2, pp 273–276.
48. A. Telea, C. Sminchisescu, and S. Dickinson, “Optimal inference for Hierarchical Skeleton Abstraction”, Proceedings, International Conference on Pattern Recognition (ICPR), Cambridge, U.K., August 2004, Vol. 4, pp 19–22.
49. M. F. Demirci, A. Shokoufandeh, Y. Keselman, S. Dickinson, and L. Bretzner, “Many-to-Many Matching Feature Matching Using Spherical Coding of Directed Graphs”, Proceedings, European Conference on Computer Vision (ECCV), Prague, May 2004, pp 322–335.
50. Y. Keselman, A. Shokoufandeh, M. F. Demirci, and S. Dickinson, “Many-to-Many Graph Matching via Metric Embedding”, Proceedings, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Madison, WI, June 2003, pp 850–857.
51. M. F. Demirci, A. Shokoufandeh, Y. Keselman, S. Dickinson, and L. Bretzner, “Many-to-Many Matching of Scale-Space Hierarchies using Metric Embedding”, Proceedings, 4th International Conference on Scale Space and PDE Methods in Computer Vision, Skye, UK, June 2003, pp 17–32.
52. H. Sundar, D. Silver, N. Gagvani and S. Dickinson, “Skeleton Based Shape Matching and Retrieval”, Proceedings, The International Conference on Shape Modeling and Applications (SMI), Korea, May 2003, pp 130–142.
53. D. Macrini, A. Shokoufandeh, S. Dickinson, K. Siddiqi, and S. Zucker, “View-Based 3-D Object Recognition using Shock Graphs”, Proceedings, International Conference on Pattern Recognition (ICPR), Quebec, August 2002, pp 24–28.
54. A. Shokoufandeh, S. Dickinson, L. Bretzner, C. Jönsson, and T. Lindeberg, “The Representation and Matching of Qualitative Shape at Multiple Scales”, European Conference on Computer Vision (ECCV), Copenhagen, May 2002, pp 759–775.
55. Y. Keselman and S. Dickinson, “Generic Model Abstraction from Examples”, Proceedings, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Kauai, Hawaii, December 2001, pp 856–863.
56. C. Sminchisescu, D. Metaxas and S. Dickinson, “Improving the Scope of Deformable Model Shape and Motion Estimation”, Proceedings, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Kauai, Hawaii, December 2001, pp 485–492.
57. A. Shokoufandeh, S. Dickinson, K. Siddiqi, and S. Zucker, “Indexing using a Spectral Encoding of Topological Structure”, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Fort Collins, CO, June 1999, pp 491–497.

58. A. Shokoufandeh, I. Marsic, and S. Dickinson, "View-Based Object Matching", IEEE International Conference on Computer Vision (ICCV), Bombay, January 1998, pp 588–595.
59. K. Siddiqi, A. Shokoufandeh, S. Dickinson, and S. Zucker, "Shock Graphs and Shape Matching", IEEE International Conference on Computer Vision (ICCV), Bombay, January 1998, pp 222–229.
60. D. Wilkes, S. Dickinson and J. Tsotsos, "A Quantitative Model of View Degeneracy and its Application to Active Focal Length Control", Proceedings, International Conference on Computer Vision (ICCV), Cambridge, MA, June 1995, pp 938–944.
61. M. Chan, D. Metaxas, and S. Dickinson, "Physics-Based Tracking of 3-D Objects in 2-D Image Sequences", Proceedings, 12th International Conference on Pattern Recognition (ICPR), Jerusalem, Israel, October 1994, pp 432–436.
62. D. Wilkes, S. Dickinson, E. Rivlin, and R. Basri, "Navigation Based on a Network of 2-D Images", Proceedings, 12th International Conference on Pattern Recognition (ICPR), Jerusalem, Israel, October 1994, pp 373–378.
63. M. Chan, D. Metaxas, and S. Dickinson, "A new Approach to Tracking 3-D Objects in 2-D Image Sequences", Proceedings, National Conference on Artificial Intelligence (AAAI), Seattle, August 1994, pp 960–965.
64. S. Dickinson, P. Jasiobedzki, G. Olofsson, and H. Christensen, "Qualitative Tracking of 3-D Objects Using Active Contour Networks", Proceedings, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Seattle, June 1994, pp 812–817.
65. E. Rivlin, S. Dickinson, and A. Rosenfeld, "Recognition by Functional Parts", Proceedings, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Seattle, June 1994, pp 267–274.
66. S. Dickinson, H. Christensen, J. Tsotsos, and G. Olofsson, "Active Object Recognition Integrating Attention and Viewpoint Control", Proceedings, European Conference on Computer Vision (ECCV), May 1994, pp B:3–14.
67. D. Metaxas and S. Dickinson, "Integration of Quantitative and Qualitative Techniques for Deformable Model Fitting from Orthographic, Perspective, and Stereo Projections", Proceedings, Fourth International Conference on Computer Vision (ICCV), Berlin, May 1993, pp 641–649.
68. S. Dickinson, A. Pentland, and A. Rosenfeld, "Qualitative 3-D Shape Reconstruction Using Distributed Aspect Matching", Proceedings, Third IEEE International Conference on Computer Vision (ICCV), Osaka, Japan, December 1990, pp 257–262.
69. S. Dickinson and L. Davis, "An Expert Vision System for Autonomous Land Vehicle Road Following", Proceedings, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Ann Arbor, MI, June 1988, pp 826–831.

## Invited Articles in Conference and Workshop Proceedings

70. S. Dickinson, A. Shokoufandeh, Y. Keselman, F. Demirci, and D. Macrini, “Object Categorization and the Need for Many-to-Many Matching”, invited paper, Proceedings, 27th Annual Meeting of the German Association for Pattern Recognition (DAGM), Vienna, Austria, August 2005, pp 501–510.
71. A. Shokoufandeh, Y. Keselman, M. F. Demirci, D. Macrini, and S. Dickinson, “Many-to-Many Feature Matching in Object Recognition”, invited paper, in: H. Christensen and H.-H. Nagel (eds.), Dagstuhl Seminar on *Cognitive Vision Systems: Sampling the Spectrum of Approaches*, Springer Lecture Notes in Computer Science (3948), 2006, pp 107–125.
72. D. Macrini, A. Shokoufandeh, S. Dickinson, K. Siddiqi, and S. Zucker, “Spectral Methods for View-Based 3-D Object Recognition using Silhouettes”, invited paper, 8th IAPR International Workshop on Structural and Syntactic Pattern Recognition (SSPR), Windsor, Ontario, August 2002, Springer Lecture Notes in Computer Science (2396), 2002, pp 1–14.
73. Y. Keselman and S. Dickinson, “Generic Model Abstraction from Examples”, invited paper, in G. Hager, H. Christensen, H. Bunke, and R. Klein (eds.), Dagstuhl Seminar on *Modelling of Sensor-Based Intelligent Robot Systems*, Springer Lecture Notes in Computer Science (2238), 2002, pp 1–24.
74. A. Shokoufandeh and S. Dickinson, “Graph-Theoretical Methods in Computer Vision”, invited paper, First Summer School on Theoretical Aspects of Computer Science, Tehran, Iran, July 2000, appears in Springer Lecture Notes in Computer Science (2292), 2002, pp 148–174.
75. Y. Keselman and S. Dickinson, “Bridging the Representation Gap Between Models and Exemplars”, invited paper, Proceedings, IEEE Computer Society Workshop on Models versus Exemplars in Computer Vision, Kauai, Hawaii, December, 2001 (e-proceedings).
76. A. Shokoufandeh and S. Dickinson, “A Unified Framework for Indexing and Matching Hierarchical Shape Structures”, in: C. Arcelli, L. Cordella, and G. Sanniti di Baja (eds.), Proceedings, Visual Form 2001: 4th International Workshop on Visual Form (IWVF-4), Lecture Notes in Computer Science (2059), Springer, Capri, Italy, May 2001, pp 67–84.
77. S. Dickinson, A. Rosenfeld, and A. Pentland, “Primitive-Based Shape Modeling and Recognition”, in: C. Arcelli, L. Cordella, and G. Sanniti di Baja (eds.), *Visual Form: Analysis and Recognition*, Plenum Press, New York, 1992, pp 213–229 (Proceedings, International Workshop on Visual Form (IWVF-1), Capri, Italy, May 1991.)

## Other Refereed Conference and Workshop Proceedings

78. S. Dickinson, “Beyond one-to-one feature correspondence: The need for many-to-many matching and image abstraction”, Proceedings, International Workshop on Stochastic Image Grammars, Miami, June 2009, pg 12.
79. S. Mathe, S. Dickinson, S. Stevenson, and A. Fazly, “Learning the Abstract Motion Semantics of Verbs from Captioned Videos”, Proceedings, 3rd International Workshop on Semantic Learning and Applications in Multimedia (SLAM), Anchorage, Alaska, June 2008.
80. P. Sala and S. Dickinson, “Model-Based Perceptual Grouping and Shape Abstraction”, Proceedings, Sixth IEEE Computer Society Workshop on Perceptual Organization in Computer Vision (POCV), Anchorage, Alaska, June 2008.

81. J. Moringen, S. Wachsmuth, S. Dickinson, and S. Stevenson, “Learning Visual Compound Models from Parallel Image-Text Datasets”, 30th Annual Symposium of the German Association for Pattern Recognition (DAGM2008), Munich, June 2008.
82. F. Qureshi, D. Macrini, D. Chung, J. Maclean, S. Dickinson, and P. Jasiobedzki, “A Computer Vision System for Spaceborne Safety Monitoring”, Proceedings, 8th International Symposium on Artificial Intelligence, Robotics and Automation in Space (iSAIRAS), Munich, September 2005, e-proceedings.
83. A. Bataille and S. Dickinson, “Coarse-to-Fine Object Recognition using Shock Graphs”, Proceedings, Proceedings, 5th IAPR-TC15 Workshop on Graph-Based Representations for Pattern Recognition (GbR), April 2005, France, pp 203–212.
84. J. Maclean, D. Chung, and S. Dickinson, “Integrating Region and Boundary Information for Improved Spatial Coherence in Object Tracking”, Proceedings, IEEE Workshop on Articulated and NonRigid Motion, Washington, D.C., June 2004, 8 pages, e-proceedings.
85. S. Wachsmuth, S. Stevenson, and S. Dickinson, “Towards a Framework for Learning Structured Shape Models from Text-Annotated Images”, HLT-NAACL03 Workshop on Learning Word Meaning from Non-Linguistic Data, Edmonton, June 2003, pp 22–29.
86. A. Shokoufandeh and S. Dickinson, “Applications of Bipartite Matching to Problems in Object Recognition”, Proceedings, ICCV Workshop on Graph Algorithms and Computer Vision, September 1999, 18 pages, e-proceedings.
87. W. Zhang, S. Dickinson, S. Sclaroff, J. Feldman, and S. Dunn, “Shape-Based Indexing in a Medical Image Database”, IEEE Workshop on Biomedical Image Analysis, Santa Barbara, CA, June 1998, pp 221–230.
88. S. Dickinson, A. Pentland, and S. Stevenson, “Viewpoint-Invariant Indexing for Content-Based Image Retrieval”, IEEE International Workshop on Content-based Access of Image and Video Databases”, Bombay, January 1998, pp 20–30.
89. A. Shokoufandeh, I. Marsic, and S. Dickinson, “Saliency Regions as a Basis for Object Recognition”, Proceedings, 3rd International Workshop on Visual Form (IWVF-3), Capri, Italy, May 1997, pp 539–548.
90. W. Zhang, S. Dickinson, S. Sclaroff, I. Marsic, S. Hawkins, J. Feldman, and S. Dunn, “Searching Medical Image Databases by Image Content”, IEEE Workshop on Image and Multidimensional Digital Signal Processing (IMDSP), Belize City, March 1996, pp 146–147.
91. J. Tsotsos, S. Dickinson, M. Jenkin, E. Milios, A. Jepsen, B. Down, E. Amdur, S. Stevenson, M. Black, D. Metaxas, J. Cooperstock, S. Culhane, F. Nuflo, G. Verghese, W. Wai, D. Wilkes, and Y. Ye, “The PLAYBOT Project”, Workshop on AI Applications for Disabled People, held in conjunction with the 14th International Joint Conference on Artificial Intelligence (IJCAI), Montreal, Canada, August 1995.
92. S. Dickinson, D. Metaxas, and A. Pentland, “Constrained Recovery of Deformable Models from Range Data”, Proceedings, 2nd International Workshop on Visual Form (IWVF-2), Capri, Italy, May 1994, pp 158–167.
93. S. Dickinson and D. Metaxas, “Decoupling Recognition and Localization in CAD-Based Vision”, 2nd CAD-Based Vision Workshop, Champion, PA, February 1994, pp 246–257.

94. S. Dickinson, S. Stevenson, E. Amdur, J. Tsotsos, and L. Olsson, “Integrating Task-Directed Planning with Reactive Object Recognition”, invited paper, Proceedings, SPIE Intelligent Robotics and Computer Vision XII, Boston, MA, September 1993, pp 212–224.
95. S. Dickinson, G. Olofsson, and H. Christensen, “Qualitative Prediction in Active Recognition”, Proceedings, 8th Scandinavian Conference on Image Analysis (SCIA), University of Tromsø, Norway, May 1993, pp 337–344.
96. D. Wilkes, S. Dickinson, and J. Tsotsos, “Quantitative Modeling of View Degeneracy”, Proceedings, 8th Scandinavian Conference on Image Analysis (SCIA), University of Tromsø, Norway, May 1993, pp 89–96.
97. S. Dickinson and D. Metaxas, “Using Qualitative Shape to Constrain Deformable Model Fitting”, Sensor Fusion V, SPIE OE/Technology ’92, Boston, MA, November 1992, pp 24–36.
98. S. Dickinson and A. Pentland, “A Unified Approach to the Recognition of Expected and Unexpected Geon-Based Objects”, Proceedings, SPIE Applications of AI X: Machine Vision and Robotics, Orlando, FL, April 1992, pp 614–627.
99. S. Dickinson, A. Pentland, and A. Rosenfeld, “From Volumes to Views: An Approach to 3-D Object Recognition”, Proceedings, Workshop on Directions in Automated “CAD-Based” Vision, Maui, HI, June 1991, pp 85–96.
100. S. Dickinson, A. Pentland, and A. Rosenfeld, “Qualitative 3-D Shape Reconstruction for 3-D Object Recognition”, Proceedings, AAAI-90 Workshop on Qualitative Vision, Boston, MA, July 1990, pp 87–91.
101. L. S. Davis, D. DeMenthon, S. Dickinson, and P. Veatch, “Algorithms for Road Navigation”, Proceedings, IEEE Roundtable Discussion on Vision-Based Vehicle Guidance, Tokyo, Japan, July 1990.
102. S. Dickinson, J. Le Moigne, R. Waltzman, and L. S. Davis, “An Expert Vision System for Autonomous Land Vehicle (ALV) Road Following”, Proceedings, SPIE Conference on Applications of Artificial Intelligence V, Orlando, FL, May 1987, pp 190–197.
103. S. Dickinson, L. Gaiot, and M. Jernigan, “Computer Visual Inspection of Liquid Crystal Displays”, Proceedings, Graphics Interface ’83, Edmonton, Alberta, Canada, May 1983, pp 113–117.

### **Refereed Panels**

104. S. Dickinson (Chair), I. Biederman, A. Pentland, J.-O. Eklundh, R. Bergevin, and R. Munck-Fairwood, “The Use of Geons for Generic 3-D Object Recognition”, Proceedings, International Joint Conference on Artificial Intelligence (IJCAI), Chambéry, France, August 1993, pp 1693–1699.

### **Unrefereed Workshops and Conferences**

105. A. Levinshtein, C. Sminchisescu, and S. Dickinson, “Qualitative 3D Surface Reconstruction from Images”, invited extended abstract and poster presentation, Snowbird Learning Workshop, Snowbird, Utah, April 2008.

106. E. Rivlin, S. Dickinson, and A. Rosenfeld, “Recognition by Functional Parts”, Proceedings, DARPA Image Understanding Workshop, Monterey, CA, November 1994, pp 1531–1539.

### Technical Reports

107. K. Siddiqi, A. Shokoufandeh, S. Dickinson, and S. Zucker, “Shock Graphs and Shape Matching”, Technical Report DCS-TR-345, Laboratory for Computer Science Research, Department of Computer Science, Rutgers University, October, 1997. (also appears as Technical Report RuCCS TR-39, Rutgers University Center for Cognitive Science, Rutgers University, October 1997)
108. A. Shokoufandeh, I. Marsic, and S. Dickinson, “View-Based Object Recognition using Saliency Maps”, Technical Report DCS-TR-339, Laboratory for Computer Science Research, Department of Computer Science, Rutgers University, August, 1997. (also appears as Technical Report RuCCS TR-36, Rutgers University Center for Cognitive Science, Rutgers University, August 1997)
109. S. Dickinson and D. Metaxas, “Using Aspect Graphs to Control the Recovery and Tracking of Deformable Models”, Technical Report DCS-TR-338, Laboratory for Computer Science Research, Department of Computer Science, Rutgers University, August, 1997. (also appears as Technical Report RuCCS TR-37, Rutgers University Center for Cognitive Science, Rutgers University, August 1997)
110. S. Dickinson and D. Metaxas, “Integrating Qualitative and Quantitative Object Representations in the Recovery and Tracking of 3-D Shape”, Technical Report LCSR-TR-281, Laboratory for Computer Science Research, Department of Computer Science, Rutgers University, September, 1996. (also appears as Technical Report RuCCS TR-30, Rutgers University Center for Cognitive Science, Rutgers University, September 1996)
111. S. Dickinson, D. Metaxas, and A. Pentland, “The Role of Model-Based Segmentation in the Recovery of Volumetric Parts from Range data”, Technical Report LCSR-TR-280, Laboratory for Computer Science Research, Department of Computer Science, Rutgers University, September, 1996. (also appears as Technical Report RuCCS TR-28, Rutgers University Center for Cognitive Science, Rutgers University, September 1996)
112. S. Dickinson, R. Bergevin, I. Biederman, J.-O. Eklundh, A. Jain, R. Munck-Fairwood, and A. Pentland, “Panel Report: The Potential of Geons for Generic 3-D Object Recognition”, Technical Report LCSR-TR-276, Laboratory for Computer Science Research, Department of Computer Science, Rutgers University, September, 1996. (also appears as Technical Report RuCCS TR-29, Rutgers University Center for Cognitive Science, Rutgers University, September 1996)
113. S. Dickinson, H. Christensen, J. Tsotsos, and G. Olofsson, “Active Object Recognition Integrating Attention and Viewpoint Control”, Technical Report LCSR-TR-268, Laboratory for Computer Science Research, Department of Computer Science, Rutgers University, July, 1996. (also appears as Technical Report RuCCS TR-26, Rutgers University Center for Cognitive Science, Rutgers University, July 1996)
114. E. Rivlin, S. Dickinson, and A. Rosenfeld, “Recognition by Functional Parts”, Technical Report LCSR-TR-246, Laboratory for Computer Science Research, Department of Computer

- Science, Rutgers University, June, 1995. (also appears as Technical Report RuCCS TR-20, Rutgers University Center for Cognitive Science, Rutgers University, June 1995, and as Technical Report CAR-TR-703, Center for Automation Research, University of Maryland, February 1994)
115. M. Chan, D. Metaxas, and S. Dickinson, "Physics-Based Tracking of 3D Objects in 2D Image Sequences", Technical Report IRCS-94-22, Institute for Research in Cognitive Science, University of Pennsylvania, 1994.
  116. S. Dickinson and D. Metaxas, "Integrating Qualitative and Quantitative Shape Recovery", Technical Report LCSR-TR-232, Laboratory for Computer Science Research, Department of Computer Science, Rutgers University, October, 1994. (also appears as Technical Report RuCCS TR-14, Rutgers University Center for Cognitive Science, Rutgers University, December 1994)
  117. D. Wilkes, S. Dickinson and J. Tsotsos, "A Computational Model of View Degeneracy and its Application to Active Focal Length Control", Technical Report LCSR-TR-231, Laboratory for Computer Science Research, Department of Computer Science, Rutgers University, October, 1994. (also appears as Technical Report RuCCS TR-15, Rutgers University Center for Cognitive Science, Rutgers University, December 1994)
  118. D. Wilkes, S. Dickinson, E. Rivlin, and R. Basri, "Navigation Based on a Network of 2D Images", Proceedings, Ontario Hydro Research Technical Report ARK94-PUB-15, August 1994.
  119. K. Chen, M. Ishikawa, and S. Dickinson, "3-D Shape Recovery Based on A Parallel Network", Research Memo, Kyutech Institute of Technology, Japan, October 1993.
  120. S. Dickinson and A. Pentland, "A Unified Approach to the Recognition of Expected and Unexpected Geon-Based Objects", Technical Report 153, Vision and Modeling Group, Media Laboratory, Massachusetts Institute of technology, April 1992.
  121. S. Dickinson, A. Pentland, and A. Rosenfeld, "From Volumes to Views: An Approach to 3-D Object Recognition" Technical Report 166, Vision and Modeling Group, Media Laboratory, Massachusetts Institute of Technology, February 1992.
  122. S. Dickinson, A. Pentland, and A. Rosenfeld, "3-D Shape Recovery using Distributed Aspect Matching", technical Report 144, Vision and Modeling Group, Media Laboratory, Massachusetts Institute of technology, February 1992.
  123. S. Dickinson, "The Recovery and Recognition of Three-Dimensional Objects using Part-Based Aspect Matching", Technical Report CAR-TR-572, Center for Automation Research, University of Maryland, August 1991.
  124. S. Dickinson, A. Pentland, and A. Rosenfeld, "Qualitative 3-D Shape Recovery Using Distributed Aspect Matching", Technical Report CAR-TR-505, Center for Automation Research, University of Maryland, June 1990.
  125. S. Dickinson, A. Pentland, and A. Rosenfeld, "A Representation for Qualitative 3-D Object Recognition Integrating Object-Centered and Viewer-Centered Models", Technical Report CAR-TR-453, Center for Automation Research, University of Maryland, June 1989.

126. S. Dickinson and L. Davis, “An Expert Vision System for Autonomous Land Vehicle Road Following”, Technical Report CAR-TR-330, Center for Automation Research, University of Maryland, October 1987.
127. S. Chandran, L. S. Davis, D. DeMenthon, S. Dickinson, S. Gajulapalli, S. Huang, T. Kushner, J. Le Moigne, S. Puri, T. Siddalingaiah, and P. Veatch, “An Overview of Vision-Based Navigation for Autonomous Land Vehicles 1986”, Technical Report CAR-TR-285, Center for Automation Research, University of Maryland, April 1987.

## Grants

### Awarded

1. “Integrating Experiential and Service Learning into the Computer Science Curriculum”, A Proposal to the Curriculum Renewal Initiatives Fund, C. Boutilier, J. Clarke, S. Dickinson, P. Gries, and A. Jepson, \$41,600K/2 years, awarded 2008.
2. “Storage and Analysis of Image and Video Data”, D. Fleet, PI, S. Dickinson and K. Kutulakos, co-PI’s, Natural Sciences and Engineering Research Council of Canada (NSERC) Research Tools and Instruments (Category 1) Program, \$87,151/1 year, awarded 2007.
3. “Image Abstraction and Generic Object Recognition”, S. Dickinson, PI, Natural Sciences and Engineering Research Council of Canada (NSERC), \$170,000/5 years, awarded 2005.
4. “Automatic Text Annotation of Image and Video Data”, S. Dickinson, PI, A. Jepson, S. Stevenson, and R. Zemel, co-PI’s, CITO, \$250,000/2 years, awarded 2005.
5. “Semantic Retrieval of Image and Video Data”, S. Dickinson, PI, A. Jepson, and S. Stevenson, co-PI’s, Natural Sciences and Engineering Research Council of Canada (NSERC) Collaborative Research and Development Grant, \$43,300/2 years, awarded 2005.
6. “An Image Acquisition Laboratory for Object Recognition Research”, Natural Sciences and Engineering Research Council of Canada (NSERC), Research Tools & Instruments and Major Facilities Access Applications, S. Dickinson, PI, A. Jepson, co-PI, \$51,800/1 year, awarded 2004.
7. “Image Abstraction and Generic Object Recognition”, S. Dickinson, PI, Natural Sciences and Engineering Research Council of Canada (NSERC), \$30,000/1 year, awarded 2004.
8. “A Visual Supervisor for the International Space Station”, S. Dickinson, PI, J. Maclean, P. Jasiobedzki, co-PI’s, Communications and Information Technology Ontario (CITO), \$200,000/2 years, awarded 2003.
9. (Ontario) Premiere’s Research Excellence Award (PREA), S. Dickinson, PI, awarded March, 2002. \$150,000/5 years, awarded 2002.
10. “Novel Indexing and Retrieval of Dynamic Brain Images”, P. Kantor and S. Hanson, PI’s, S. Dickinson, D. Silver, B. Bly, L. Shepp, and J. Cohen, co-PI’s, National Science Foundation Cross-Cutting Initiative in Information Technology Research (ITR) Program, US\$2,034,722/3 years, awarded 2002.

11. “Dynamic, Real-Time Hand Gesture Recognition with an Application to Camera System Control in a Distance-Learning Setting”, J. Tsotsos, PI, with S. Dickinson, M. Jenkin, R. Wildes, and R. Owston, co-PI’s, Natural Sciences and Engineering Research Council of Canada (NSERC), Institute for Robotics and Intelligent Systems (IRIS), \$474,000/3 years, awarded 2002.
12. “Visual Behaviours for Space-Based Robotic Tasks”, S. Dickinson, PI, J. Maclean, P. Jasiobedzki, co-PI’s, Communications and Information Technology Ontario (CITO), \$57,750/18 months, awarded 2001.
13. “Visual Behaviours for Space-Based Robotic Tasks”, S. Dickinson, PI, J. Maclean, P. Jasiobedzki, co-PI’s, Natural Sciences and Engineering Research Council of Canada (NSERC) Collaborative Research and Development Grant, \$60,000/18 months, awarded 2001.
14. “Generic Object Recognition”, S. Dickinson, PI, Natural Sciences and Engineering Research Council of Canada (NSERC), \$120,000/4 years, awarded 2000.
15. “Theoretical and Experimental Research into Intelligent Control Methods”, J. K. Tsotsos, S. Dickinson, M. Jenkin, P. Jasiobedzki, L. Gregoris, and D. Parry, Centre for Research in Earth and Space technology (CRESTech) Project SP00ROB30, \$92,500/2 years, awarded 2002.
16. “Generic Object Recognition”, S. Dickinson, PI, Natural Sciences and Engineering Research Council of Canada (NSERC), \$150,000/4 years, awarded 2004.
17. “Associative Mining of Large Datasets”, D. Silver, PI, M. Parashar, N. Zabusky and S. Dickinson, co-PI’s, National Science Foundation ITR Program, \$474,000/3 years, awarded 2000.
18. “Vision-Equipped Agents for the Disabled”, S. Dickinson, PI, J. Feldman, D. DeCarlo, P. Meer, D. Mavroidis, Z. Liu, R. Gallistel (UCLA), Z. Pylyshyn, I. Kovacs, T. Papatomas, E. Kowler, S. Dunn, co-PI’s, Rutgers University Information Sciences Council Pilot project Award, \$30,470/1 year, awarded 1999.
19. “A Laboratory for Interactive Applications for Computational Vision and Language”, S. Dickinson, PI, S. Stevenson, M. Stone, and D. DeCarlo, co-PI’s, National Science Foundation (NSF) CISE CDA (Research Instrumentation), \$116,928/3 years (including \$40,000 matching from Rutgers University), awarded 1999.
20. “KDI: Multimodal Collaboration Across Wired and Wireless Networks”, National Science Foundation (NSF) Knowledge Distributed Intelligence Program, J. L. Flanagan, PI, D. J. Goodman, C. A. Kulikowski, S. Dickinson, N. B. Mandayam, M. Mantei Tremaine, I. Marsic, P. Meer, M. Parashar, co-PI’s, \$2,200,000/3 years, awarded 1998.
21. “Visual Perception and Language.” National Institutes of Health (NIH), National Research Service Award (NRSA) Institutional Training Grant Program. Grant 1-T32-MH 19975-01A1, Z. Pylyshyn, PI, N. Belkin, G. Chapman, S. Dickinson, J. Feldman, J. Fodor, J. Grimshaw, H. Hirsh, B. Julesz, E. Kowler, C. Kulikowski, E. Lepore, A. Leslie, R. Matthews, L. T. McCarthy, T. Papatomas, A. Prince, C. Schmidt, S. Stich, K. Stromswold, and S. Stevenson, co-PI’s, \$504,840/5 years, awarded 1998.
22. “Viewpoint-Invariant Shape Indexing for Content-Based Image Retrieval”, Army Research Office (ARO), S. Dickinson, PI, and S. Stevenson, co-PI, \$35,000/1 year, awarded 1998.

23. NSF Equipment supplement to National Science Foundation (NSF) CAREER award, S. Dickinson, PI, \$40,000/1 year, awarded 1998.
24. “Digital Libraries Initiative”, Strategic Resource and Opportunity Analysis (SROA) Award (Rutgers University internal funding), P. Cantor, PI, Z. Pylyshyn, N. Belkin, H. Hirsh, S. Dickinson, B. Bly, S. Hanson, co-PI’s, \$135,000/1 year, awarded 1998.
25. “Scientific Visualization and Modeling Initiative”, Strategic Resource and Opportunity Analysis (SROA) Award (Rutgers University internal funding), N. Zabusky, PI, S. Dickinson, D. Silver, M. Parashar, D. Metaxas, co-PI’s, \$100,000/1 year, awarded 1998.
26. Human-Computer Interaction Initiative, Strategic Resource and Opportunity Analysis (SROA) Award (Rutgers University internal funding), Z. Pylyshyn and B. Adelson, PI’s, S. Dickinson, H. Hirsh, and N. Belkin, co-PI’s, \$135,000/1 year, awarded 1997.
27. NSF Research Experiences for Undergraduates supplement to National Science Foundation (NSF) CAREER award, S. Dickinson, PI, \$5000/6 weeks, awarded 1997.
28. Human-Computer Interaction Initiative, Strategic Resource and Opportunity Analysis (SROA) Award (Rutgers University internal funding), Z. Pylyshyn and B. Adelson, PI’s, S. Dickinson, H. Hirsh, and N. Belkin, co-PI’s, \$15,000/1 year, awarded 1996.
29. NSF Research Experiences for Undergraduates supplement to National Science Foundation (NSF) CAREER award, S. Dickinson, PI, \$5000/6 weeks, awarded 1996.
30. “Generic Object Recognition in a Dynamic Environment”, National Science Foundation (NSF) Faculty Career Development (CAREER) Program, S. Dickinson, PI, \$200,000/4 years, awarded 1996.
31. “Video Database Query by Image Content”, AT&T Foundation Special Purpose Grant, S. Dickinson, PI, \$15,000/1 year, awarded 1995.
32. “Model-Based Object Recognition by Physics-Based Shape Recovery”, D. Terzopoulos, PI, S. Dickinson and D. Metaxas, co-PI’s, Natural Sciences and Engineering Research Council of Canada (NSERC), Collaborative Grants Program, \$149,000/3 years, awarded 1995.

## **Invited Presentations**

### **Invited Plenary Conference/Workshop Presentations**

1. “The Evolution of Object Categorization and the Challenge of Shape Abstraction”, invited speaker, Dagstuhl Seminar on Form and Function, Oct. 18–23, 2009.
2. “Symmetric Part Abstraction from Real Images”, invited speaker, Workshop on Trends in Computer Vision (an event to celebrate Jan-Olof Eklundh’s 70th birthday), Prague, July 27–29, 2009.
3. “Beyond One-to-One Feature Correspondence: The Need for Many-to-Many Matching and Image Abstraction”, keynote speaker, SIG-09: First International Workshop on Stochastic Image Grammars, Miami, FL, June 21, 2009.
4. “Generic Object Recognition and the Need for Image Abstraction”, keynote speaker, 27th DAGM - The Annual meeting of the German Association for Pattern Recognition, Vienna, Austria, August 30, 2005.

5. “Object Categorization and the Need for Many-to-Many Matching”, invited speaker, Canadian Institute for Advanced Research (CIAR) Workshop on Neural Computation and Adaptive Perception, Toronto, July 10-11, 2005.
6. “Generic Object Recognition and the Need for Image Abstraction”, keynote speaker, Visual Computing Workshop, DePaul University, May 21, 2004.
7. “Many-to-Many Feature Matching in Object Recognition”, invited speaker, Dagstuhl Seminar on Cognitive Vision Systems, Oct. 28, 2003.
8. “A Spectral Characterization of Graph Structure and its Application to Graph Indexing and Matching in Computer Vision”, keynote speaker, 9th ASCI (Advanced School for Computing and Imaging) Conference, Heijten, Netherlands, June 4–6, 2003.
9. “Spectral Methods for View-Based 3-D Object Recognition”, keynote speaker, 8th IAPR International Workshop on Structural and Syntactic Pattern Recognition (SSPR’2002), Windsor, Ontario, August 7, 2002.
10. “Bridging the Representation Gap Between Models and Exemplars”, invited speaker, IEEE Computer Society Workshop on Models versus Exemplars in Computer Vision, Kauai, Hawaii, December 14, 2001.
11. “Generic Model Abstraction from Examples”, invited speaker, Stockholm (Rosenon) Workshop on Computational Vision, August 2, 2001.
12. “A Unified Framework for Indexing and Matching Hierarchical Shape Structures”, keynote speaker, 4th International Workshop on Visual Form, Capri, Italy, May 30, 2001.
13. “Vision for the Disabled: Navigation and Recognition”, invited speaker, Dagstuhl Seminar on Modelling of Sensor-Based Intelligent Robot Systems, October 20, 2000.
14. “A Spectral Encoding of Tree Structure and its Application to Shape Indexing and Matching”, invited speaker, NSF DIMACS Workshop on Discrete Mathematical Problems with Medical Applications, DIMACS, Rutgers University, December 8, 1999.
15. “A Spectral Encoding of Tree Structure and its Application to Shape Indexing and Matching”, invited speaker, Workshop in Honor of Jan-Olof Eklundh, Royal Institute of Technology (KTH), Stockholm, Sweden, August 18, 1999.
16. “Generic Shape Indexing and Matching for 2-D Object Recognition”, invited speaker, DIMACS Workshop on Large-Scale Discrete Optimization in Robotics and Vision, Rutgers University, March 22, 1999.
17. “View-Based 3-D Object Recognition Using Saliency Regions”, invited speaker, Dagstuhl Seminar on Knowledge-Based Computer Vision, December 10, 1997.
18. “Using Aspect Graphs to Control both Shape Recovery and Shape tracking”, invited speaker, Workshop on Spatial Computing: Representation, Interpretation and Applications, Curtin University of Technology, Perth, Western Australia, December 2–3, 1995.
19. “Bridging the Gap Between Data-Driven and Model-Driven Computer Vision”, invited speaker, special session on Computer Vision and Robotics, 33rd Annual Allerton Conference on Communication, Control, and Computing, Allerton Park, Illinois, October 4–6, 1995.

20. “Integrating Qualitative and Quantitative Object Representations in the Recovery and Tracking of 3-D Shape”, invited speaker, York University Conference on Perceptual Coding, York University, Toronto, June 20–24, 1995.
21. “Functional Components”, invited speaker, Workshop on the Role of Functionality in Object Recognition, CVPR ’94, Seattle, June 20, 1994,
22. “Beyond CAD-Based Vision”, invited speaker, Joint EC-US Workshop on Control of Perception in Active Vision, University of Massachusetts, Amherst, October 19–21, 1993.

### **Invited University/Institute Lectures**

23. “Object Categorization and the Need for Many-to-Many Matching”, Department of Computer Science, Technical University Darmstadt, October 23, 2009.
24. “Object Categorization and the Need for Many-to-Many Matching”, Department of Computer Science, University of California at Santa Barbara, March 12, 2009.
25. “Object Categorization and the Need for Many-to-Many Matching”, Department of Computer Science, University of Western Ontario, November 28, 2008.
26. “Object Categorization and the Need for Many-to-Many Matching”, GRASP Laboratory Colloquium, University of Pennsylvania, April 25, 2008.
27. “Learning Structured Appearance Models from Captioned Images of Cluttered Scenes”, Department of Computer Science Colloquium, Drexel University, April 24, 2008.
28. “Object Categorization and the Need for Many-to-Many Matching”, Electrical and Computer Engineering Department, North Carolina State University, January 25, 2007.
29. “Object Categorization and the Need for Many-to-Many Matching”, McGill Colloquium, School of Computer Science, McGill University, November 9, 2007.
30. “Learning Structured Appearance Models from Captioned Images of Cluttered Scenes”, Center for Machine perception, Czech Technical University Prague, June 28, 2007.
31. “Generic Object Recognition and the Need for Many-to-Many Matching”, Department of Computer Science, Boston University, November 16, 2006.
32. “Generic Object Recognition and the Need for Many-to-Many Matching”, Department of Computer Science Colloquium Series, Tufts University, November 15, 2006.
33. “Generic Object Recognition and the Need for Many-to-Many Matching”, Department of Electrical and Computer Engineering, Queen’s University, October 20, 2006.
34. “Generic Object Recognition and the Need for Many-to-Many Matching”, Special Learning & Memory/Cognitive Colloquium, Purdue University, IN, January 11, 2006.
35. “The Perceptual Grouping of Local Features for Image Annotation and Vision-Based Navigation”, Center for Machine Perception, Faculty of Applied Computer Science, University of Bielefeld, Germany, April 28, 2006.
36. “Generic Object Recognition and the Need for Many-to-Many Matching”, Special Learning & Memory/Cognitive Colloquium, Purdue University, IN, January 11, 2006.

37. "Generic Object Recognition and the Need for Image Abstraction", Department of Computer Science and Engineering, University of Notre Dame, Notre Dame, IN, January 12, 2006.
38. "Many-to-Many Feature Matching in Object Recognition", Center for Machine Perception, Faculty of Applied Computer Science, University of Bielefeld, Germany, June 21, 2004.
39. "Many-to-Many Feature Matching in Object Recognition", Center for Machine Perception, Department of Cybernetics, Faculty of Electrical Engineering, Czech Technical University, Prague, May 17, 2004.
40. "A Spectral Characterization of Graph Structure and its Application to Graph Indexing and Matching in Computer Vision", School of Computer Science, Curtin University, Perth, Australia, July 1, 2003.
41. "A Unified Framework for Indexing and Matching Hierarchical Shape Structures", Departments of Computer Science and Electrical Engineering, University of California at Santa Barbara, March 14, 2003.
42. "A Unified Framework for Indexing and Matching Hierarchical Shape Structures", Department of Computer Science, Brown University, March 11, 2003.
43. "Generic Model Abstraction from Examples", Center for Vision Research, York University, January 17, 2003.
44. "Generic Model Abstraction from Examples", Computer Vision Colloquium Series, Departments of Electrical Engineering and Computer and Information Science, Ohio State University, November 7, 2002.
45. "Generic Model Abstraction from Examples", Biomedical Imaging Group, Department of Biomedical Engineering, Technical University of Eindhoven, October 2, 2002.
46. "A Unified Framework for Indexing and Matching Hierarchical Shape Structures", Department of Biomedical Engineering, Technical University of Eindhoven, September 30, 2002.
47. "Shape Matching and Indexing in Medical Imaging", Mount Sinai Department of Pathology, May 13, 2002.
48. "Bridging the Representational Gap in Computer Vision", Department of Computer Science, University of Central Florida, April 15, 2002.
49. "A Spectral Encoding of Tree Structure and its Application to Shape Indexing and Matching", Institute of Photogrammetry, University of Bonn, August 7, 2000.
50. "The Fall and Rise of Generic Object Recognition", University of Bielefeld, Germany, May 22, 2000.
51. "Generic Shape Indexing and Matching for 2-D Object Recognition", Department of Physiology, University of Bergen, Norway, June 11, 1999.
52. "Generic Shape Indexing and Matching for 2-D Object Recognition", Department of Computer Science, University of Toronto, Toronto, Canada, May 10, 1999.
53. "Generic Shape Indexing and Matching for 2-D Object Recognition", Department of Computer Science, York University, Toronto, Canada, March 16, 1999.

54. "Generic Shape Indexing and Matching for 2-D Object Recognition", Department of Computer Science, University of Waterloo, February 3, 1999.
55. "Generic Shape Indexing and Matching for 2-D Object Recognition", Department of Computer Science and Engineering, University of South Florida, October 26, 1998.
56. "Generic Shape Indexing and Matching for 2-D Object Recognition", Royal Institute of Technology (KTH), Stockholm, Sweden, May 27, 1998.
57. "Towards Generic 3-D Object Recognition", University of Bielefeld, Germany, May 21, 1998.
58. "Generic Shape Indexing and Matching for 2-D Object Recognition", University of Bielefeld, Germany, May 20, 1998.
59. "Generic Shape Indexing and Matching for 2-D Object Recognition", Sarnoff Corporation, April 21, 1998.
60. "View-Based Shape Matching", Department of Computer Science, University of Kentucky, October 23, 1997.
61. "View-Based Shape Matching", Department of Computer Science, McGill University, September 26, 1997.
62. "Object Recognition in a Dynamic Environment", Department of Electrical and Computer Engineering, University of California at Santa Barbara, March 21, 1997.
63. "Object Recognition in a Dynamic Environment", Department of Biomedical Engineering, Rutgers University, September 30, 1996.
64. "Object Recognition in a Dynamic Environment", NEC Research Labs, Princeton, NJ, April 4, 1996.
65. "Object Recognition in a Dynamic Environment", Department of Computer Science, Columbia University, March 20, 1996.
66. "Object Recognition in a Dynamic Environment", Department of Electrical Engineering and Computer Science, Yale University, February 23, 1996.
67. "Object Recognition in a Dynamic Environment", Siemens Research Laboratory, Princeton, NJ, February 7, 1996.
68. "Getting Your Computer to Recognize Three-Dimensional Objects", RuCCS "What is Cognitive Science?" Colloquium Series, Rutgers University, November 2, 1995.
69. "Integrating Qualitative and Quantitative Shape Recovery", Department of Psychology "Visionaries" Colloquium, Rutgers University, October 7, 1994.
70. "Integrating Qualitative and Quantitative Shape Recovery", Computational Vision and Active Perception Laboratory, Royal Institute of Technology (KTH), Stockholm, Sweden, May 11, 1994.
71. "Integrating Qualitative and Quantitative Shape Recovery", Department of Computer Science and Rutgers University Center for Cognitive Science (RuCCS), Rutgers University, New Brunswick, NJ, April 27, 1994.

72. "Integrating Qualitative and Quantitative Shape Recovery", Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, MI, April 15, 1994.
73. "Integrating Qualitative and Quantitative Shape Recovery", Xerox PARC Image Understanding Group, Palo Alto, CA, March 24, 1994.
74. "An Introduction to Object Recognition by Computer", Department of Computer Science, Mills College, Oakland, CA, March 23, 1994.
75. "Integrating Qualitative and Quantitative Shape Recovery", Department of Computer Science, York University, Toronto, Ontario, March 4, 1994.
76. "Integrating Qualitative and Quantitative Shape Recovery", Department of Computer Science, University of New Brunswick, Canada, February 16, 1994.
77. "Integrating Qualitative and Quantitative Shape Recovery", Computer Vision Group, Computing Science Center, University of Geneva, Geneva, Switzerland, August 26, 1993.
78. "Integrating Qualitative and Quantitative Visual Shape Recovery", Department of Computer Science, University of Toronto, May 6, 1993.
79. "Decoupling Object Recognition and Object Localization", Departments of Computer Science and Psychology, University of Southern California, February 12, 1993.
80. "Coarse-To-Fine Object Recognition", Dept. of Electronic and Electrical Engineering, University of Surrey, Surrey, UK, September 21, 1992.
81. "The Recovery and Recognition of Three-Dimensional Objects using Part-Based Aspect Matching", Department of Computer Science, York University, Toronto, Canada, December 18, 1991.
82. "From Volumes to Views: An Approach to 3-D Object Recognition", Department of Computer Science, University of Toronto, Toronto, Canada, April 15, 1991.
83. "Qualitative 3-D Object Recognition Integrating Object-Centered and Viewer-Centered Models", Vision and Modeling Group, Media Laboratory, Massachusetts Institute of Technology, July 20, 1989.

#### **Invited Lectures/Courses in Educational Forums**

84. "Building Machines that Understand What They See", Computing Insights 2007, Department of Computer Science, University of Toronto, July 12, 2007.
85. "Graph Matching and Object Recognition", invited course, Copenhagen Image and Signal Processing Graduate School, IT University, Denmark, May 26-29, 2003.
86. "Object Representation and Recognition", Computing Insights 2001, Department of Computer Science, University of Toronto, July 11, 2001.
87. "Object Representation and Recognition", DIMACS Reconnect Two Day Workshop for Two Year College Teachers, Rutgers University, May 22, 1999.

88. “The Representation, Recovery, and Recognition of Geon-Based Objects”, invited speaker, Nordic Summer School on Active Vision and Geometrical Modeling, Aalborg, Denmark, September 10, 1992.
89. “3-D Shape Recovery Using Distributed Aspect Matching”, invited speaker, Scottish Universities Summer School in Physics, University of Dundee, Dundee, Scotland, August 15, 1990.

## **Student/Postdoctoral Fellow Supervision**

### **Postdoctoral Fellow Supervision**

- Afsaneh Fazly, Department of Computer Science, University of Toronto, 2006–2009, co-supervision with Suzanne Stevenson.
- Robert Sim, Department of Computer Science, University of Toronto, 2003–2005.
- Cristian Sminchisescu, Department of Computer Science, University of Toronto, 2003–2005, co-supervision with Allan Jepson.
- Sven Wachsmuth, Department of Computer Science, University of Toronto, 2002–2003, co-supervision with Suzanne Stevenson.
- Ee-chien Chang, Rutgers University Center for Discrete Mathematics and Theoretical Computer Science (DIMACS), 1999–2000.

### **Ph.D. Students in Progress**

- Anatoliy Kats, Department of Computer Science, University of Toronto, Ph.D. thesis advisor, 2009–present, expected completion: 2013.
- Stefan Mathe, Department of Computer Science, University of Toronto, Ph.D. thesis co-advisor (with Suzanne Stevenson), 2005–present, expected completion: 2010.
- Alex Levinshtein, Department of Computer Science, University of Toronto, Ph.D. thesis co-advisor (with Cristian Sminchisescu), 2005–present, expected completion: 2010.
- Mike Jamieson, Department of Computer Science, University of Toronto, Ph.D. thesis co-advisor (with Suzanne Stevenson), 2004–present, expected completion: 2009.
- Pablo Sala, Department of Computer Science, University of Toronto, Ph.D. thesis advisor, 2004–present, expected completion: 2010.
- Diego Macrini, Department of Computer Science, University of Toronto, Ph.D. thesis co-advisor (with David Fleet), 2003–present, expected completion: 2009.

### **M.Sc. Students in Progress**

- Tom Lee, Department of Computer Science, University of Toronto, M.Sc. thesis advisor, 2009–present, expected completion: 2011.

### **Ph.D. Students Completed**

- Yakov Keselman, Department of Computer Science, Rutgers University, Ph.D. thesis advisor, March, 2005.
- Ali Shokoufandeh, Department of Computer Science, Rutgers University, Ph.D. thesis advisor, thesis title: Graph Theoretic Methods in Object Recognition and Related Problems in Extremal Graph Theory, August 1999.

### **M.S. Students Completed**

- Anatoliy Kats, Department of Computer Science, University of Toronto, M.S. thesis advisor, 2007–present, expected completion: 2009.
- Gertruda Grolinger, Department of Computer Science, University of Toronto, M.Sc. advisor, 2007–2009.
- Alex Levinshtein, Department of Computer Science, University of Toronto, M.Sc. advisor, 2003–2005.
- Pablo Sala, Department of Computer Science, University of Toronto, M.Sc. advisor, 2002–2004.
- Aurelie Bataille, Department of Computer Science, University of Toronto, M.Sc. advisor, 2002–2004.
- Diego Macrini, Department of Computer Science, University of Toronto, M.Sc. advisor, 2000–2003.
- Cristian Sminchisescu, Department of Computer Science, Rutgers University, M.Sc. advisor, 1999.
- Ali Shokoufandeh, Department of Computer Science, Rutgers University, M.Sc. advisor, 1996.

### **Ph.D. Committees (internal)**

- Rama Natarajan, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2009.
- Dustin Lang, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2009.
- Patricio Simari, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2009.
- Xuming He, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2007.
- Faisal Qureshi, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2006.
- Francisco Estrada, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2004.

- Gustavo Carneiro, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2004.
- Thomas F. El-Maraghi, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2002.
- Gabriella Hristescu, Department of Computer Science, Rutgers University, Ph.D. Thesis Committee Member, August 2000.

#### **Ph.D. Committees (external)**

- Elke Braun, Department of Computer Science, University of Bielefeld, Germany, Ph.D. thesis defence external examiner, April 2006.
- Fatih Demirci, Department of Mathematics and Computer Science, Drexel University, Ph.D. thesis defence external committee member, December 2005.
- Ulukbek Ibraev, School of Communication Information and Library Studies, Rutgers University, Ph.D. thesis committee member, September 2005.
- Fatih Demirci, Department of Mathematics and Computer Science, Drexel University, Ph.D. thesis proposal external committee member, May 2004.
- Quoc Dinh Phung, Department of Computer Science, Curtin University, Australia, Ph.D. thesis external examiner, March 2005.
- Ulukbek Ibraev, School of Communication Information and Library Studies, Rutgers University, Ph.D. thesis proposal external committee member, February 2005.
- Qiang Lu, Department of Computer Science and Engineering, University of Buffalo, Ph.D. thesis external examiner, July 2004.
- Ba Tu Truong, Department of Computer Science, Curtin University, Australia, Ph.D. thesis external examiner, July 2004.
- Nam Thanh Nguyen, Department of Computer Science, Curtin University, Australia, Ph.D. thesis external examiner, March 2003.
- Brett Adams, Department of Computer Science, Curtin University, Australia, Ph.D. thesis external examiner, November 2002.
- Sven Wachsmuth, der Technischen Fakultät der Universität Bielefeld, Germany, Ph.D. thesis external examiner, September, 2001.
- David Melcher, Department of Psychology, Rutgers University, Ph.D. thesis committee, April 2001.
- Keven Weber, Department of Computer Science, Curtin University, Australia, Ph.D. thesis external examiner, 1998.
- Michael Reed, Department of Computer Science, Columbia University, Ph.D. thesis external examiner, 1998.

- Fee-Fee Lim, Department of Computer Science, Curtin University, Australia, Ph.D. thesis external examiner, 1997.
- Kenong Wu, Department of Electrical Engineering, McGill University, Ph.D. thesis external examiner, 1996.
- C.P. Lam, Department of Computer Science, Curtin University, Australia, Ph.D. thesis external examiner, 1995.
- Mike Robey, Department of Computer Science, Curtin University, Australia, Ph.D. thesis external examiner, 1994.

### **M.S. Committees (internal)**

- Sofia Karygianni, Department of Computer Science, University of Toronto, second reader, M.Sc. thesis, 2009.
- Albert Rothenstein, Department of Computer Science, University of Toronto, second reader, M.Sc. thesis, 2002.
- Tanya Ruppell, Department of Computer Science, University of Toronto, second reader, M.Sc. thesis, 2001.
- John Midgley, Department of Computer Science, University of Toronto, second reader, M.Sc. thesis, 2001.
- Francisco Estrada, Department of Computer Science, University of Toronto, second reader, M.Sc. thesis, 2001.
- Jennifer Listgarten, Department of Computer Science, University of Toronto, second reader, M.Sc. thesis, 2000.

### **M.S. Committees (external)**

- Siraj Sabihuddin, Department of Electrical and Computer Engineering, University of Toronto, April, 2008.
- Leyla Imanirads, Department of Electrical and Computer Engineering, University of Toronto, October, 2006.
- Svetlana Stolpner, Department of Computer Science, McGill University, M.S. thesis external examiner, September, 2006.
- Catherine Laporte, Department of Electrical & Computer Engineering, McGill University, M.E. thesis external examiner, July 2004.
- Druva Dattatraya, Department of Mechanical and Aerospace Engineering, Rutgers University, M.Sc. Thesis Committee Member, January 2000.
- Zhang Wei, Department of Biomedical Engineering, Rutgers University, M.Sc. Thesis Committee Member, 1996.

## Undergraduate Student Advising

- Zoya Gavrilov, Department of Computer Science, University of Toronto, summer internship advisor, 2009.
- Yulia Eskin, Department of Computer Science, University of Toronto, NSERC summer internship advisor, 2008.
- Gertruda Grolinger, Department of Computer Science, University of Toronto, NSERC summer internship advisor, 2007.
- Matthijs van Eede, Department of Computer Science, Technical University of Eindhoven, 4th year research internship supervisor, 2004–2005.
- Tim van Dijk, Department of Computer Science, Technical University of Eindhoven, 4th year research internship supervisor, 2004–2005.
- Svetlana Stolpner, Department of Computer Science, University of Toronto, summer research internship advisor, 2004.
- Marcus Brubaker, Department of Computer Science, University of Toronto, summer research internship advisor, 2003.
- Svetlana Stolpner, Department of Computer Science, University of Toronto, summer research internship advisor, 2003.
- Jordan Hesse, Department of Engineering Science, University of Toronto, 4th year thesis supervisor, 2002–2003.
- Maxim Trokhimtchouk, Department of Mathematics, University of Toronto, NSERC summer internship advisor, 2002.
- Alex Levinshtein, Department of Computer Science, University of Toronto, NSERC summer internship advisor, 2002.
- Maxim Trokhimtchouk, Department of Mathematics, University of Toronto, NSERC summer internship advisor, 2001.
- Ronak Parikh, Department of Computer Science, Rutgers University, Undergraduate Honors Thesis Advisor, 2000.
- Carolyn Klivans, Department of Mathematics, MIT, NSF/DIMACS Research Experiences for Undergraduates (REU) Program, 1999.
- Christopher Malon, Department of Mathematics, University of Chicago, NSF/DIMACS Research Experiences for Undergraduates (REU) Program, 1999.
- Carolyn Klivans, Department of Mathematics, Cornell University, NSF/DIMACS Research Experiences for Undergraduates (REU) Program, 1998.
- David Rosenberg, Department of Computer Science, Yale University, NSF/DIMACS Research Experiences for Undergraduates (REU) Program, 1997.
- James Ezick, Department of Computer Science, SUNY Buffalo, NSF/DIMACS Research Experiences for Undergraduates (REU) Program, 1996.

- Fernando Nuflo, Department of Computer Science, University of Toronto, 4th year project supervisor, 1994.
- Mario Portoraro, Department of Computer Science, University of Toronto, 4th year project supervisor, 1994.
- Martin Martin, Department of Computer Science, University of Toronto, 4th year project supervisor, 1993.
- Ken Shih, Department of Engineering Science, University of Toronto, 4th year thesis supervisor, 1992–1993.

## Editorial Boards

- Series Co-Editor (with G. Medioni), *Synthesis Lectures on Computer Vision*, Morgan & Claypool Publishers, 2009–present.
- Member, Editorial Board, *International Journal of Computer Vision*, 2009–present.
- Member, Editorial Board, *Image and Vision Computing*, 2008–present.
- Member, Editorial Board, *IET Computer Vision*, 2006–present.
- Member, Editorial Board, *Journal of Electronic Imaging*, 2006–present.
- Member, Editorial Board, *Pattern Recognition Letters*, 2004–present.
- Member, Editor-in-Chief Reappointment Committee, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 2006.
- Associate Editor, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 1998–2003.
- Co-Editor (with R. Zabih and M. Pelillo), IEEE PAMI special issue on graph-theoretic algorithms in computer vision, Volume 23, Number 10, October 2001.

## External Service

- Area Chair, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), San Francisco, CA, June 2010.
- Workshop Co-Chair, Second International Workshop on Shape Perception in Human and Computer Vision, Regensburg, Germany, August 2009.
- Program Committee Member, Workshop on Visual and Contextual Learning from Annotated Images and Videos, Miami, FL, June 2009.
- Program Committee Member, International Workshop on Graph-Based Representations for Pattern Recognition, Venice, Italy, May 2009.
- Standing Committee Member, IAPR (International Association for Pattern Recognition) ICPR (International Conference on Pattern Recognition), 2008–2010.

- Workshop Co-Chair, First International Workshop on Shape Perception in Human and Computer Vision, Marseille, October 2008.
- Program Committee Member, European Conference on Computer Vision, Marseille, October 2008.
- Track Co-Chair (Computer Vision), International Conference on Pattern Recognition (ICPR), Tampa, FL, August 2008.
- Workshops Chair, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Anchorage, June 2008.
- Program Committee Member, 6th IEEE Workshop on Perceptual Organization in Computer Vision, Anchorage, June 2008.
- Vice Chair, International Association for Pattern Recognition (IAPR) Technical Committee #15 (Graph-Based Representations in Pattern Recognition), 2007–present.
- Co-Chair, IEEE Workshop on Object Categorization, Rio de Janeiro, October 15, 2007. This is the fourth in a series of international workshops I have co-organized on the topic of generic object recognition and object categorization, since 1997.
- Program Committee Member, International Conference on Computer Vision (ICCV), Rio de Janeiro, October, 2007.
- Program Committee Member, EMMCVPR 2007, Lotus Hill Institute, China, August 2007.
- Program Committee Member, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Minneapolis, MN, June 2007.
- Program Committee Member, International Workshop on Graph-Based Representations for Pattern Recognition, Alicante, Spain, June 2007.
- Program Committee Member, International Conference on Computer Vision Systems, Bielefeld, Germany, March 2007.
- Consultant and Advisor to Tufts University in helping to set up a new program in cognitive science, 2006.
- Program Committee Member, Canadian Conference in Computer and Robot Vision (CRV), Quebec City, June 2006.
- Program Committee Member, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), New York, NY, June 2006.
- Program Committee Member, European Conference on Computer Vision (ECCV), Graz, May 2006.
- Program Committee Member, IEEE International Conference on Computer Vision (ICCV), Beijing, September 2005.
- Program Committee Member, Joint IAPR International Workshop on Structural and Syntactical Pattern Recognition (SSPR 2006) and Statistical Pattern Recognition (SPR 2006), Hong Kong, China, August 2006.

- Program Committee Member, 2nd IEEE Workshop on Vision for Human Computer Interaction, New York, NY, June 2006.
- Program Committee Member, 1st International Conference on Computer Vision Theory and Applications (VISAPP), Setubal, Portugal, February 2006.
- Program Committee Member, IEEE International Conference on Mechatronics and Automation, Niagara Falls, ON, July 2005.
- Program Committee Member, IEEE Workshop on Vision for Human-Computer Interaction, San Diego, June 2005.
- Program Committee Member, Canadian Conference on Computer and Robot Vision (CRV), Victoria, B.C., May 2005.
- Program Committee Member, IEEE Workshop on Vision for Human-Computer Interaction, in conjunction with CVPR 2005, San Diego, June 2005.
- Program Committee Member, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), San Diego, CA, June 2005.
- Member, International Association of Pattern Recognition Technical Committee 15, Graph-Based Representations in Pattern Recognition, 2005–2005.
- Program Committee Member, 4th Indian Conference on Computer Vision, Graphics and Image Processing, Kolkata, December 2004.
- Program Committee Member, International Conference on Pattern Recognition (ICPR), Cambridge, U.K., August 2004.
- Program Committee Member, International Workshop on Structural and Syntactic Pattern Recognition (SSPR), Lisbon, August 2004.
- Co-Chair, IEEE Workshop on Generic Object Recognition and Categorization, Washington, D.C., June 2004.
- Area Chair (Object Recognition), IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Washington, D.C., June 2004.
- Area Chair (Object Recognition), IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Madison, Wisconsin, June 2003.
- Member, Steering Committee, York University Center for Vision Research, 2003–2005.
- Program Committee Member, 2nd IEEE Workshop on Variational, Geometric and Level Set Methods in Computer Vision, in Conjunction with the 9th IEEE International Conference in Computer Vision (ICCV), October 2003, Nice, France.
- Program Committee Member, 25th German Conference on Artificial Intelligence (KI-2002), September 2002, Aachen, Germany.
- Program Committee Member, International Conference on Pattern Recognition (ICPR), Quebec City, Canada, August 2002.

- Program Committee Member, International Workshop on Structural and Syntactic Pattern Recognition (SSPR), Windsor, Canada, August 2002.
- Program Committee Member, IEEE International Conference on Computer Vision (ICCV), Vancouver, B.C., July 2001.
- Program Committee Member, Workshop on Statistical and Computational Theories of Vision: Modeling, Learning, Computing, and Sampling, Vancouver, B.C., July 2001.
- Program Committee Member, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Hilton Head, SC, June 2000.
- Program Committee Member, IEEE International Conference on Computer Vision (ICCV), Corfu, Greece, September 1999.
- Co-Chair, IEEE Workshop on Generic Object Recognition, Corfu, Greece, September 1999.
- Program Committee Member, International Workshop on Graph Algorithms and Computer Vision, Corfu, Greece, September 1999.
- Co-Chair, DIMACS Workshop on Graph-Theoretic Methods in Computer Vision, DIMACS, Rutgers University, May 1999.
- Area Chair (Model Acquisition), IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Fort Collins, CO, June 1999.
- Program Committee Member, Workshop on Statistical and Computational Theories of Vision: Modeling, Learning, Computing, and Sampling, Fort Collins, CO, June 1999.
- Vice Chair of Program Committee, 9th International Conference on Tools with Artificial Intelligence, Newport beach, November 1997.
- Co-Chair, IEEE Workshop on Generic Object Recognition, San Juan, Puerto Rico, June 1997.
- Program Committee Member, Thirteenth National Conference on Artificial Intelligence (AAAI), Portland, OR, August 1996.
- Program Committee Member, 13th International Conference on Pattern Recognition (ICPR), Vienna, Austria, August 1996.
- Program Committee Member, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), San Francisco, June 1996.
- Program Committee Member, Workshop on Spatial and Temporal Interaction: Representation and Reasoning, International Conference on Automation, Robotics, and Computer Vision, Singapore, Nov 1994.

**Reviewer for the Following Journals:**

- IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)
- IEEE Transactions on Robotics and Automation
- IEEE Transactions on Image Processing
- IEEE Computational Science and Engineering
- IEEE Transactions on Neural Networks
- IEEE Transactions on Systems, Man, and Cybernetics
- Computer Vision and Image Understanding (CVIU)
- International Journal of Computer Vision (IJCV)
- Journal of Mathematical Imaging and Vision (JMIV)
- Image and Vision Computing (IVC)
- IEE Proceedings on Vision, Image, and Signal Processing
- Proceedings of the IEEE
- Machine Vision and Applications (MVA)
- Electronics Letters
- Pattern Recognition
- Pattern Recognition Letters
- Journal of Vision (ARVO)

**Reviewer for the Following Agencies:**

- NSERC, Canada.
- Canada Foundation for Innovation (CFI)
- Fonds Quebecois de Recherche sur la Nature et les Technologies
- Austrian Science Fund
- National Science Foundation (three times a panelist)
- Air Force Office of Scientific Research (AFOSR)
- Army Research Office (ARO)

## University Service

- Chair, Space Committee, Department of Computer Science, University of Toronto, 2009–2010.
- Member, Senior Promotions Committee, Department of Computer Science, University of Toronto, 2009–2010.
- Acting Chair, Department of Computer Science, University of Toronto, 2008–2009.
- Chair, Senior Promotions Committee, Department of Computer Science, University of Toronto, 2008–2009.
- Chair, Planning and Budget Committee, Department of Computer Science, University of Toronto, 2008–2009.
- Chair, PTR Committee, Department of Computer Science, University of Toronto, 2008–2009.
- Co-Chair, Teaching Load Restructuring Committee, Department of Computer Science, University of Toronto, 2008–2009.
- Co-Chair, Graduate Research Skills Committee, Department of Computer Science, University of Toronto, 2008–2009.
- Member, Faculty Recruiting Committee, Department of Computer Science, University of Toronto, 2008–2009.
- Member, International Recruitment Working Group, Faculty of Arts and Science, University of Toronto, 2008–2009.
- Member, Department of Computer Science Time Pressures Committee, 2007–2008.
- Member, Newsletter Advisory Committee, Department of Computer Science, University of Toronto, 2007–2008.
- Chair, Space Committee, Department of Computer Science, University of Toronto, 2006–2007, 2007–2008.
- Vice Chair, Department of Computer Science, University of Toronto, 2003–2006.
- Member (ex officio), Budget and Planning Committee, Department of Computer Science, University of Toronto, 2005–2006.
- Member (ex officio), Departmental Space Committee, Department of Computer Science, University of Toronto, 2005–2006.
- Chair, Departmental Awards Committee, Department of Computer Science, University of Toronto, 2004–2005, 2005–2006.
- Member (ex officio) PTR Committee, Department of Computer Science, University of Toronto, 2003–2004, 2004–2005, 2005–2006.
- Member (ex officio) Faculty Recruiting Committee, Department of Computer Science, University of Toronto, 2004–2005.

- Member (ex officio), Faculty Support Staff Selection Committee, Department of Computer Science, University of Toronto, 2004–2005.
- Member (ex officio), Departmental Computing Committee, Department of Computer Science, University of Toronto, 2003–2004, 2004–2005, 2005–2006.
- Member (ex officio), Graduate Office Manager Selection Committee, Department of Computer Science, University of Toronto, 2003–2004.
- Member (ex officio), Chief Administrative Officer Selection Committee, Department of Computer Science, University of Toronto, 2003–2004, 2005–2006.
- Member (ex officio), Faculty Advisory Committee, Department of Computer Science, University of Toronto, 2003–2004.
- Member (ex officio), Graduate Office Manager Selection Committee, Department of Computer Science, University of Toronto, 2004–2005, 2005–2006.
- Chair, University of Toronto Bell University Laboratory (BUL) Chair Search Committee, 2006.
- Member, University of Toronto Bell University Laboratory (BUL) Grants Selection Committee, 2004–2005, 2005–2006.
- Member, Graduate Committee, Department of Computer Science, University of Toronto, 2000–2001, 2001–2002.
- Member, Graduate Admissions Committee, Department of Computer Science, University of Toronto, 2000–2001.
- Member, NRSA Steering Committee, Rutgers Center for Cognitive Science, 1998–1999, 1999–2000.
- Member, Faculty of Arts and Sciences (FAS) Computer Advisory Committee, Rutgers University, 1997–1998, 1998–1999.
- Member, New Brunswick Advisory Committee for Instructional Computing, Rutgers University 1997–1998, 1998–1999, 1999–2000.
- Chair, Departmental Web Page Design Committee, Rutgers university Department of Computer Science, 1997–1998, 1998–1999.
- Member, Hiring Committee, Rutgers University Department of Computer Science, 1995–1996, 1996–1997, 1997–1998, 1998–1999.
- Member, Steering Committee for the Human-Computer Interaction Program of the Information Sciences Strategic Planning Follow-Through Committee, Rutgers University, 1996–1997, 1997–1998.
- Member, Search Committee, Assistant Research Professor, Laboratory for Vision Research and Department of Psychology, Rutgers University, Spring 1997.
- Member, Program Committee, Undergraduate Minor in Cognitive Science, Rutgers Center for Cognitive Science, Spring 1996.

- Chair, Colloquium Committee, Rutgers University Department of Computer Science, 1995–1996, 1996–1997.
- Coordinator, Rutgers University Series on Human and Computer Vision, 1994–1995, 1995–1996, 1996–1997, 1997–1998, 1998–1999, 1999–2000.
- Member, Executive Committee, Rutgers Center for Cognitive Science, 1994–1995, 1995–1996, 1996–1997, 1997–1998, 1998–1999, 1999–2000.
- Member, Technical Committee, Rutgers Center for Cognitive Science, 1994–1995, 1995–1996, 1996–1997, 1997–1998, 1998–1999, 1999–2000.
- Member, Publicity Committee, Rutgers Center for Cognitive Science, 1994–1995, 1995–1996, 1996–1997, 1997–1998, 1998–1999, 1999–2000.
- University of Maryland Representative, Image Understanding Environments Committee, DARPA, 1990–1991.
- Graduate Student Representative, Committee to Restructure the Comprehensive Exam System, Department of Computer Science, University of Maryland, 1990–1991.
- Graduate Student Representative, Center for Automation Research Internal Review Committee, University of Maryland, 1990–1991.
- Graduate Student Representative, Committee to Study Student Evaluation Procedures, Computer Science Graduate Student Council, University of Maryland, 1990–1991.

## Curriculum Development

- Developed a new course, entitled, “Graph Matching and Object Recognition.” I was invited by Professor Mads Nielsen, IT University, Denmark, to teach a one-week course (during my sabbatical) in the Copenhagen Image and Signal Processing Graduate School. “The school is funded by the participating universities and the Danish Research Training Council. The goal of the school is to assist education of researchers in image processing, signal processing and pattern recognition, by extending and consolidating the research education activities (Ph.D.-courses, workshops, visitors), creating tighter phd-student networks, and finally by offering a professional infrastructure.” I co-taught the course with professor Ali Shokoufandeh (my former Ph.D. student) in May 26-29, 2003, and plan to offer it in the future as an advanced graduate seminar in our own department.
- Introduced new course (first offered in January, 2007) into the University of Toronto’s Department of Computer Science’s undergraduate curriculum: CSC420 Introduction to Image Understanding.
- Introduced new course (first offered in January, 2001) into the University of Toronto’s Department of Computer Science’s graduate curriculum: CSC2523: Object Modeling and Recognition. This course replaced CSC2523: Computational Vision II, and focuses on the issues surrounding the problem of object recognition.
- Introduced new course into the Rutgers University Department of Computer Science’s graduate curriculum: 16:198:534 Image Understanding.

- Co-developed the *Proseminar in Cognitive Science*, a core course required for the Cognitive Science Graduate Certificate Program. It is team-taught by the RuCCS faculty.
- Co-developed *Cognitive Science: A Multidisciplinary Introduction*, a core course required for the Undergraduate Cognitive Science Minor. It is team-taught by the RuCCS faculty.

### **Courses Offered**

- Image Understanding (undergraduate) (csc420, UofT).
- Computational Vision II (graduate) (csc2523, UofT).
- File Structures and Data Management (undergraduate) (csc228, UofT).
- Introduction to Artificial Intelligence (undergraduate) (01:198:440, Rutgers).
- Proseminar in Cognitive Science (graduate) (16:185:500, Rutgers), team-taught with other RuCCS faculty.
- Cognitive Science: A Multidisciplinary Introduction (undergraduate, Rutgers) (01:185:201), team-taught with other RuCCS faculty.
- Image Understanding (graduate) (01:198:534, Rutgers).
- Introduction to Artificial Intelligence (graduate) (16:198:520, Rutgers).
- Graduate Seminar in Computer Vision (graduate) (16:198:671, Rutgers).