Curriculum Vitae

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1   Research Interests

My research interests revolve around the problem of shape perception in computer vision and, more recently, human vision. Much of my recent work focuses on perceptual grouping and its role in image segmentation and shape recovery. I've introduced numerous qualitative shape representations, and their basis in symmetry provides a focus for my perceptual grouping research. My interest in multiscale, parts-based shape representations, and their common abstraction as hierarchical graphs, has motivated my research in inexact graph indexing and matching – key problems in object recognition, another broad focus of my research. My research has also explored many problems related to object recognition, including object tracking, vision-based navigation, content-based image retrieval, language-vision integration, and image/model abstraction.

2   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.

3   Employment History

3.1   Academic Positions

- **Professor**, Department of Computer Science, University of Toronto, 2007–present.

- **Faculty Affiliate**, Vector Institute for Artificial Intelligence, June 1, 2018–present.

- **Member**, Teaching Staff, University College, University of Toronto, July 1, 2017–June 30, 2020.

- **Chair**, Department of Computer Science, University of Toronto, 2010–2015.

- **Acting Chair**, Department of Computer Science, University of Toronto, 2008–2009.

- **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.

3.2   Visiting/Adjunct Positions

- **Visiting Professor**, Department of Computer Science, University of California, Santa Barbara, 2015–2016.

- **Faculty Member**, University of Toronto Institute for Robotics and Mechatronics, 2013–present.

- **Adjunct Scientist**, AI & Robotics Team, Toronto Rehabilitation Institute, University of Toronto, 2010–present.

- **Visiting Professor**, Department of Computer Science, University of California, Santa Barbara, 2010–2011.

- **Visiting Professor**, School of Computer Science, Curtin University, Summer 2002.

- **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.

3.3   Industrial/Consulting/Advisory Positions

- **Vice President, Research and Development, and Head**, Samsung AI Research Center, Toronto, 2018. (inaugural Head; served as inaugural **Chief Scientist** for the first six months, until a Chief Scientist was recruited)

- **Member, Advisory Board**, VISTA (Vision: Science to Applications), 2021–present.

- **Member, Advisory Board**, Centre for Artificial Intelligence & Society (CAIS), York University, 2023–present.

- **Advisor**, AI Graduate Program, Dongguk University, Korea, 2020–present.

- **Member, Advisory Board**, Ingenuity Labs (previously called the Queen's Institute for Disruptive Technologies), Queen's University, 2019–present.

- **Member, Advisory Board**, eBibelot, 2017–2019.

- **Member, Advisory Board**, Centre for Innovation in Computing @ Lassonde, York University, 2014–present.

- **Member, Advisory Board**, Creative Destruction Lab at Rotman School of Management, University of Toronto, 2013–2015.

- **Consultant and Advisor** to Tufts University in helping to set up a new program in cognitive science, 2006.

- **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.

4   Honours - Awards - Distinctions

4.1   Honours

- **Fellow**, Institute of Electrical and Electronics Engineers (IEEE), 2024.

- **Fellow**, Asia-Pacific Artificial Intelligence Association (AAIA), 2023.

- **Golden Core Member**, IEEE Computer Society, 2022.

- **Honorary AI Fellow**, Agency for Science, Technology and Research (A*), Singapore, 2021.

- **Fellow**, International Association of Pattern Recognition (IAPR), 2018.

- **Lifetime Research Achievement Award**, Canadian Image Processing and Pattern Recognition Society (CIPPRS), 2012.

- **Premiere's Research Excellence Award (PREA)**, Ministry of Research and Innovation, Province of Ontario, 2002.

- **Faculty Early Career Development (CAREER) Award**, National Science Foundation, USA, 1996.

4.2 Awards

- **Dean's Excellence Award**, Faculty of Arts and Science, University of Toronto, 2002, 2003, 2004, 2005, 2006, 2009, 2011, 2012, 2013, 2014, 2015, 2016.

- **Best Paper Award**, IEEE Workshop on 3D Representation and Recognition (3dRR-15), Santiago, Chile, December 17, 2015.

- **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.

- **Outstanding Reviewer Award**, International Conference on Computer Vision (ICCV), 2005, Bejing. (10 reviewers from over 150 were chosen to receive the award)

- **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 spent part of my sabbatical).

- **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.

4.3 Distinctions

- **Appointed Head and Chief Scientist**, Samsung Artificial Intelligence Center, Toronto, 2018–present. (The Center was officially opened in May, 2018, and is one of seven Samsung AI research labs worldwide.)

- **Appointed Editor-in-Chief**, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 2017–2021. (IEEE TPAMI is the highest impact factor journal in computer vision, and among the highest across all computer science journals.)

- **Founding Co-Editor (with Gerard Medioni)**, *Synthesis Lectures on Computer Vision*, Morgan & Claypool Publishers (now Springer), 2009–present. (Synthesis Lectures are 50-100 page electronic books by prominent authors in the field of computer vision.)

5   Editorial/Advisory Roles

1. Member, Advisory Board, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 2022–present.

2. Editor-in-Chief, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 2017–2021.

3. Series Co-Editor (with G. Medioni), *Synthesis Lectures on Computer Vision*, Morgan & Claypool Publishers, 2009–present.

4. Member, Editorial Board, *Frontiers in Computer Science: Computer Vision*, 2020–present.

5. Member, Editorial Board, *Computer Vision and Image Understanding*, 2010–present.

6. Member, Editorial Board, *Graphical Models*, 2010–present.

7. Member, Editorial Board, *International Journal of Computer Vision*, 2009–present.

8. Member, Editorial Board, *Image and Vision Computing*, 2008–present.

9. Advisory Editor, *Pattern Recognition Letters*, 2011–present.

10. Member, Editorial Board, *IET Computer Vision*, 2006–present.

11. Member, Editorial Board, *Journal of Electronic Imaging*, 2006–2013.

12. Member, Editorial Board, *Pattern Recognition Letters*, 2004–2011.

13. Member, Editorial Board, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 1998–2003.

14. Member, Computer Vision Foundation (CVF) Advisory Board, 2015–present. (The Computer Vision Foundation is a non-profit organization whose purpose is to foster and support research on all aspects of computer vision.)

15. Member, PAMI-TC (Pattern Analysis and Machine Intelligence Technical Committee) Executive Committee, 2014–present. (The PAMI-TC is an elite, 18-member elected international advisory committee providing leadership on issues related to the computer vision community's conferences.)

16. Member, PAMI-TC Conference Committee (predecessor of the PAMI-TC Executive Committee), 2012–2014.

17. Member, Advisory Board, *Advances in Computer Vision and Pattern Recognition* series, Springer, 2014–present.

18. Member, IEEE Nominations Committee, 2020–present.

19. Member, IEEE Division VIII Nominating Committee, 2020–present.

20. Member, IEEE Computer Society Publications Board, 2017–present.

21. Member, IEEE Computer Society Transactions Operations Committee (TOC), 2017–present.

6 Publications

6.1 Refereed Journals

1. M. Rezanejad, J. Wilder, D. B. Walther, A. D. Jepson, S. Dickinson, and K. Siddiqi, "Shape-Based Measures Improve Scene Categorization", *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, Volume 46, Number 4, April, 2024, pp 2041–2053.

2. T. Aumentado-Armstrong, S. Tsogkas, S. Dickinson, and A. Jepson,"Disentangling Geometric Deformation Spaces in Generative Latent Shape Models", *International Journal of Computer Vision (IJCV)*, Volume 131, 2023, pp 1611–1641.

3. J. Wilder , M. Rezanejad, S. Dickinson, K. Siddiqi, A. Jepson, D. B. Walther, "Neural correlates of local parallelism during naturalistic vision", *PLOS ONE* (open access), January, 2022 pp 1–17.

4. Y. Xu, Y. Wang, S. Tsogkas, J. Wan, X. Bai, S. Dickinson, and K. Siddiqi, "DeepFlux for Skeleton Detection in the Wild", *International Journal of Computer Vision (IJCV)*, Volume 129, Issue 4, 2021.

5. J. Wilder, M. Rezanejad, S. Dickinson, K. Siddiqi, A. Jepson, and D. B. Walther, "Local Contour Symmetry Facilitates Scene Categorization", *Cognition*, Volume 182, 2019, pp 307–317.

6. J. Wilder, S. Dickinson, A. Jepson, and D. B. Walther, "Spatial Relationships Between Contours Impact Rapid Scene Classification", *Journal of Vision*, Volume 18, Number 8, 2018, pp 1–15.

7. T. Lee, S. Fidler, A. Levinshtein, C. Sminchisescu, and S. Dickinson, "A Framework for Symmetric Part Detection in Cluttered Scenes", *Symmetry*, Volume 7, 2015, pp 1333–1351.

8. A. Levinshtein, C. Sminchisescu, and S. Dickinson, "Multiscale Symmetric Part Detection and Grouping", *International Journal of Computer Vision, (IJCV)*, Volume 104, Number 2, 2013, pp 117–134.

9. E. Rezazadeh Azar, S. Dickinson, and B. McCabe, "Server-customer interaction tracker (SCIT): a computer vision-based system to estimate dirt loading cycles", *Journal of Construction Engineering and Management*, Volume 139, Issue 7, July, 2013, pp 785–794.

10. A. Shokoufandeh, Y. Keselman, M.F. Demirci, D. Macrini, and S. Dickinson, "Many-to-many feature matching in object recognition: a review of three approaches", invited paper, *IET Computer Vision*, special issue of review papers by editorial board members commemorating the 5th anniversary of the journal, Volume 6, Issue 6, November 2012, pp 1–14.

11. Z. Pizlo and S. Dickinson, Guest Editors, preface to "Special Issue on Shape Perception: Recent Results and Models", *Seeing and Perceiving*, Volume 25, 2012, pp 235–236.

12. A. Levinshtein, C. Sminchisescu, and S. Dickinson, "Optimal Image and Video Closure by Superpixel Grouping", *International Journal of Computer Vision (IJCV)*, Vol. 100, No. 1, 2012, pp 99–119.

13. M. Jamieson, Y. Eskin, A. Fazly, S. Stevenson, and S. Dickinson, "Discovering Hierarchical Object Models from Captioned Images", *Computer Vision and Image Understanding (CVIU)*, Volume 116, 2012, pp 842–853.

14. D. Macrini, S. Dickinson, D. Fleet, and K. Siddiqi, "Bone Graphs: Medial Shape Parsing and Abstraction", *Computer Vision and Image Understanding (CVIU)*, Special Issue on Graph-Based Representations, Vol. 115, No. 7, July 2011, pp 1044–1061.

15. M. Demirci, Y. Osmanlioglu, A. Shokoufandeh, and S. Dickinson, "Efficient Many-to-Many Feature Matching under the l_1 Norm", *Computer Vision and Image Understanding (CVIU)*, Special Issue on Graph-Based Representations, Vol. 115, No. 7, July 2011, pp 976–983.

16. D. Macrini, S. Dickinson, D. Fleet, and K. Siddiqi, "Object Categorization using Bone Graphs", *Computer Vision and Image Understanding (CVIU)*, Vol. 115, No. 8, August 2011, pp 1187–1206.

17. 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)*, Vol. 32., No. 1, January 2010, pp 148–164.

18. 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.

19. 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.

20. 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.

21. 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.

22. 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.

23. 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.

24. 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.

25. 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.

26. P. Sala, R. Sim, A. Shokoufandeh, and S. Dickinson, "Landmark Selection for Vision-Based Navigation", *IEEE Transactions on Robotics (RO)*, Vol. 22, No. 2, April 2006, pp 334–349.

27. 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.

28. 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.

29. 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.

30. 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.

31. 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.

32. 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.

33. 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.

34. J. Tsotsos, G. Verghese, S. Dickinson, M. Jenkin, A. Jepson, E. Milios, F. Nuflo, 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.

35. 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.

36. 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.

37. 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.

38. 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 on the Workshop on Spatial Computing: Representation, Interpretation and Applications, Curtin University of Technology, Perth, Western Australia, December 2–3, 1995.)

39. 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.

40. 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.

41. 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.

42. 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.

43. S. Dickinson and L. Davis, "A Flexible Tool for Prototyping ALV Road Following Algorithms", *IEEE Journal of Robotics and Automation (RA)*, Vol. 6, No. 2, April 1990, pp 232–242.

6.2 Editor/Co-editor, Journal Special Issues

44. Co-Editor (with Z. Pizlo), "Special Issue on Shape Perception: Recent Results and Models", *Seeing and Perceiving*, Volume 25, 2012, pp 235–236.

45. 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.

6.3 Edited Books

46. S. Dickinson and Z. Pizlo, (eds.), "Shape Perception in Human and Computer Vision: An Interdisciplinary Perspective", Advances in Computer Vision and Pattern Recognition Series, Springer Verlag, 2013, 502 pages.

47. S. Dickinson, A. Leonardis, B. Schiele, and M. Tarr, (eds.), "Object Categorization: Computer and Human Vision Perspectives", Cambridge University Press, 2009, 552 pages.

6.4 Invited Book Chapters

48. S. Dickinson, A. Levinshtein, P. Sala, and C. Sminchisescu, "The Role of Mid-Level Shape Priors in Perceptual Grouping and Image Abstraction", in: *Shape Perception in Human and Computer Vision: An Interdisciplinary Perspective*, S. Dickinson and Z. Pizlo (Eds.), Advances in Computer Vision and Pattern Recognition Series, Springer Verlag, 2013, pp 1–19.

49. S. Dickinson, A. Shokoufandeh, and K. Siddiqi, "Shock Graph", In: Katsushi Ikeuchi (Ed.). Computer Vision: A Reference Guide. Springer, New York, NY, 2014, pp 729-737.

50. S. Dickinson and I. Biederman, "Geons", In: Katsushi Ikeuchi (Ed.). Computer Vision: A Reference Guide, Springer, New York, NY, 2014, pp 338–346.

51. F. Demirci, A. Shokoufandeh, and S. Dickinson, "Many-to-Many Graph Matching", Many-to-Many Graph Matching. In: Katsushi Ikeuchi (Ed.). Computer Vision: A Reference Guide, Springer, NY, 2014, pp 472–477.

52. 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.

53. 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.

54. S. Dickinson, "Object Representation and Recognition", in: E. Lepore and Z. Pylyshyn (eds.), *What is Cognitive Science?*, Basil Blackwell publishers, 1999, pp 172–207.

55. 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.

56. 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.

57. 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.

58. 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.

59. 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.

6.5 Refereed Papers in Elite Conferences

Below are refereed, full papers appearing in the most elite conferences in computer vision, pattern recognition, robotics, machine learning, and artificial intelligence. Among the papers below, those published in CVPR, ICCV, ECCV, AAAI, and NIPS are considered archival.

60. D. Turpin, T. Zhong, S. Zhang, G. Zhu, E. Heiden, M. Macklin, S. Tsogkas, S. Dickinson, A. Garg, "DexGrasp: Dexterous Multi-finger Grasp Generation Through Differentiable Simulation, Proceedings, International Conference on Robotics and Automation (ICRA), London, UK, May-June, 2023.

61. D. Turpin, L. Wang, E. Heiden, Y.-C. Chen, M. Macklin, S. Tsogkas, S. Dickinson, and A. Garg, "Grasp'D: Differentiable Contact-rich Grasp Synthesis for Multi-fingered Hands", Proceedings, European Conference on Computer Vision (ECCV), Tel Aviv, Israel, October, 2022.

62. T. Aumentado-Armstrong, S. Tsogkas, S. Dickinson, and A. Jepson, "Representing 3D Shapes with Probabilistic Directed Distance Fields", Proceedings, IEEE Conference on Computer Vision and pattern Recognition (CVPR), New Orleans, LA, June, 2022.

63. D. Turpin, L. Wang, S. Tsogkas, S. Dickinson, and A. Garg, "GIFT: Generalizable Interaction-aware Functional Tool Affordances without Labels", Proceedings of Robotics: Science and Systems (RSS), Virtual, July, 2021.

64. C.-O. Dufresne Camaro, M. Rezanejad, S. Tsogkas, K. Siddiqi, and S. Dickinson, "Appearance Shock Grammar for Fast Medial Axis Extraction from Real Images", Proceedings, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Seattle, WA, CA, June, 2020.

65. T. Aumentado-Armstrong, S. Tsogkas, A. Jepson, and S. Dickinson, "Geometric Disentanglement for Generative Latent Shape Models", Proceedings, IEEE International Conference on Computer Vision (ICCV), Seoul, October, 2019.

66. Y. Wang, Y. Xu, S. Tsogkas, X. Bai, S. Dickinson, and K. Siddiqi, "DeepFlux for Skeletons in the Wild", Proceedings, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Long Beach, CA, June, 2019.

67. M. Rezanejad, G. Downs, J. Wilder, D. B. Walther, A. Jepson, S. Dickinson, and K. Siddiqi, "Scene Categorization from Contours: Medial Axis Based Salience Measures", Proceedings, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Long Beach, CA, June, 2019.

68. S. Tsogkas and S. Dickinson, "AMAT: Medial Axis Transform for Natural Images", Proceedings, International Conference on Computer Vision (ICCV), Venice, Italy, October, 2017.

69. T. Lee, S. Fidler, and S. Dickinson, "Learning to Combine Mid-level Cues for Object Proposal Generation", Proceedings, International Conference on Computer Vision (ICCV), Santiago, Chile, December, 2015.

70. T. Lee, S. Fidler, and S. Dickinson, "Multi-cue Mid-level Grouping", Proceedings, Asian Conference on Computer Vision (ACCV), Singapore, November 2014.

71. T. Lee, S. Fidler, and S. Dickinson, "Detecting Curved Symmetric Parts using a Deformable Disc Model", Proceedings, International Conference on Computer Vision (ICCV), Sydney, Australia, December 2013.

72. Y. Cao, D. Barrett, A. Barbu, S. Narayanaswamy, H. Yu, A. Michaux, Y. Lin, S. Dickinson, J. Siskind, and S. Wang, "Recognizing Human Activities from Partially Observed Videos", Proceedings, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Portland, Oregon, June, 2013.

73. S. Fidler, S. Dickinson, and R. Urtasun, "3D Object Detection and Viewpoint Estimation with a Deformable 3D Cuboid Model", Proceedings, Neural Information Processing Systems (NIPS), Lake Tahoe, NV, 2012, December, 2012.

74. A. Barbu, A. Bridge, Z. Burchill, D. Coroian, S. Dickinson, S. Fidler, A. Michaux, S. Mussman, S. Narayanaswamy, D. Salvi, L. Schmidt, J. Shangguan, J. Siskind, J. Waggoner, S. Wang, J. Wei, Y. Yin, and Z. Zhang, "Video In Sentences Out", Proceedings, Conference on Uncertainty in Artificial Intelligence (UAI), Catalina, CA, August 2012.

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183. 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)

184. 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)

185. 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.

186. 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.

187. 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.

188. 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.

189. 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.

190. 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.

191. 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.

192. 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.

193. 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.

194. 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.

7 Grants

1. "Shape Perception in Computer Vision, S. Dickinson, PI, Natural Sciences and Engineering Research Council of Canada (NSERC), Can$175,000/5 years, awarded 2022.

2. "Recognition of Vehicles in Satellite Views", S. Dickinson, PI, Sanja Fidler, co-PI, Mitacs-Accelerate Graduate Research Internship Program, Can$30,000/8 months, 2015.

3. "Perceptual Grouping and Shape Abstraction", S. Dickinson, PI, Natural Sciences and Engineering Research Council of Canada (NSERC), Can$215,000/5 years, awarded 2015.

4. "Real-time Object Detection and Pose Estimation from Multiple Cameras", S. Dickinson, PI, Mitacs-Accelerate Graduate Research Internship Program, Can$30,000/1 year, 2014.

5. "The Institute for Robotics and Mechatronics (IRM) SmartCare Laboratory: Healthcare Robots for the Elderly", Goldie Nejat (PI), B. Benhabib, C. Boutlilier, M. Broucke, S. Dickinson, M. Maggiore, , A. Mihailidis, and J. Mills (co-PIs), NSERC Research Tools and Instruments - Category 1, Can$149,995/1 year, 2014.

6. "Robust and Principled Visual Intelligence", J. Siskind, PI, S. Dickinson, S. Wang, co-PI's, DARPA Mind's Eye Program, USA, US$6,000,000/5 years, awarded 2010, program terminated after 2 years.

7. "Application of Data Mining Methods to Radiation Therapy Planning Automation", S. Dickinson (Academic Supervisor), Philips Healthcare (Industry Partner), and Alex Levinshtein (Postdoctoral Fellow), Mitacs Elevate Fellowship program, Can$140,000.00/2 years, awarded 2010.

8. "Image Abstraction", S. Dickinson, PI, Natural Sciences and Engineering Research Council of Canada (NSERC), Can$215,000/5 years, awarded 2010.

9. "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, Can$41,600K/2 years, awarded 2008.

10. "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, Can$87,151/1 year, awarded 2007.

11. "Image Abstraction and Generic Object Recognition", S. Dickinson, PI, Natural Sciences and Engineering Research Council of Canada (NSERC), Can$170,000/5 years, awarded 2005.

12. "Automatic Text Annotation of Image and Video Data", S. Dickinson, PI, A. Jepson, S. Stevenson, and R. Zemel, co-PI's, CITO, Can$250,000/2 years, awarded 2005.

13. "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, Can$43,300/2 years, awarded 2005.

14. "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, Can$51,800/1 year, awarded 2004.

15. "Image Abstraction and Generic Object Recognition", S. Dickinson, PI, Natural Sciences and Engineering Research Council of Canada (NSERC), Can$30,000/1 year, awarded 2004.

16. "A Visual Supervisor for the International Space Station", S. Dickinson, PI, J. Maclean, P. Jasiobedzki, co-PI's, Communications and Information Technology Ontario (CITO), Can$200,000/2 years, awarded 2003.

17. (Ontario) Premiere's Research Excellence Award (PREA), S. Dickinson, PI, awarded March, 2002. Can$150,000/5 years, awarded 2002.

18. "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, USA, US$2,034,722/3 years, awarded 2002.

19. "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), Can$474,000/3 years, awarded 2002.

20. "Visual Behaviours for Space-Based Robotic Tasks", S. Dickinson, PI, J. Maclean, P. Jasiobedzki, co-PI's, Communications and Information Technology Ontario (CITO), Can$57,750/18 months, awarded 2001.

21. "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, Can$60,000/18 months, awarded 2001.

22. "Generic Object Recognition", S. Dickinson, PI, Natural Sciences and Engineering Research Council of Canada (NSERC), Can$120,000/4 years, awarded 2000.

23. "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, Can$92,500/2 years, awarded 2002.

24. "Associative Mining of Large Datasets", D. Silver, PI, M. Parashar, N. Zabusky and S. Dickinson, co-PI's, National Science Foundation ITR Program, USA, US$474,000/3 years, awarded 2000.

25. "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. Papathomas, E. Kowler, S. Dunn, co-PI's, Rutgers University Information Sciences Council Pilot project Award, USA, US$30,470/1 year, awarded 1999.

26. "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), USA, US$116,928/3 years (including $40,000 matching from Rutgers University), awarded 1999.

27. "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, USA, US$2,200,000/3 years, awarded 1998.

28. "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. Papathomas, A. Prince, C. Schmidt, S. Stich, K. Stromswold, and S. Stevenson, co-PI's, USA, US$504,840/5 years, awarded 1998.

29. "Viewpoint-Invariant Shape Indexing for Content-Based Image Retrieval", Army Research Office (ARO), S. Dickinson, PI, and S. Stevenson, co-PI, USA, US$35,000/1 year, awarded 1998.

30. NSF Equipment supplement to National Science Foundation (NSF) CAREER award, S. Dickinson, PI, USA, US$40,000/1 year, awarded 1998.

31. "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, USA, US$135,000/1 year, awarded 1998.

32. "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, USA, US$100,000/1 year, awarded 1998.

33. 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, USA, US$135,000/1 year, awarded 1997.

34. NSF Research Experiences for Undergraduates supplement to National Science Foundation (NSF) CAREER award, S. Dickinson, PI, USA, US$5000/6 weeks, awarded 1997.

35. 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, USA, US$15,000/1 year, awarded 1996.

36. NSF Research Experiences for Undergraduates supplement to National Science Foundation (NSF) CAREER award, S. Dickinson, PI, USA, US$5000/6 weeks, awarded 1996.

37. "Generic Object Recognition in a Dynamic Environment", National Science Foundation (NSF) Faculty Career Development (CAREER) Program, S. Dickinson, PI, USA US$200,000/4 years, awarded 1996.

38. "Video Database Query by Image Content", AT&T Foundation Special Purpose Grant, S. Dickinson, PI, USA, US$15,000/1 year, awarded 1995.

39. "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, Can$149,000/3 years, awarded 1995.

8   Conference Presentations

1. J. Wilder, M. Rezanejad, S. Dickinson, K. Sidiqqi, D.B. Walther, D.B. (2020), "Local and global symmetry affect brain activity to scenes in different ways", Annual meeting of the Vision Sciences Society (VSS 2020), St. Petersburg, Florida, May 15-20.

2. M. Rezanejad, G. Downs, J. Wilder, D. B. Walther, A. Jepson, S. Dickinson, and K. Siddiqi, "Perceptual grouping aids recognition of line drawings of scenes by CNNs", Annual meeting of the Vision Sciences Society (VSS 2019), St. Petersburg, Florida, May 17-22, 2019.

3. J. Wilder, M. Rezanejad, K. Siddiqi, A. Jepson, S. Dickinson, and D. B. Walther, "The neural basis of local contour symmetry in scene perception", Annual meeting of the Vision Sciences Society (VSS 2019), St. Petersburg, Florida, May 17-22, 2019.

4. J. Wilder, M. Rezanejad, S. Dickinson, K. Siddiqi, A. Jepson, D. B. Walther, "The role of local symmetry in the neural representations of scene categories", Annual meeting of the Society for Neuroscience (SfN), San Diego, CA, November 3-7, 2018.

5. J. Wilder, M. Rezanejad, K. Siddiqi, S. Dickinson, A. Jepson, D. B. Walther, "Measuring local symmetry in real-world scenes", Annual meeting of the Vision Sciences Society (VSS 2018), St. Petersburg, Florida, May 18-23, 2018.

6. M. Rezanejad, J. Wilder, K. Siddiqi, S. Dickinson, A. Jepson, D. B. Walther, "Measuring symmetry in real-world scenes using derivative of the medial axis radius function", MODVIS: Computational and Mathematical Models in Vision. St. Petersburg, Florida, May 16-18, 2018.

7. J. Wilder, M. Rezanejad, S. Dickinson, K. Siddiqi, A. Jepson, and D. Bernhardt-Walther, "The perceptual advantage of symmetry for scene perception", Vision Science Society Seventeenth Annual Meeting (VSS 2017), St. Petersburg, FL, May 19-24, 2017.

8. J. Wilder, M. Rezanejad, S. Dickinson, A. Jepson, K. Siddiqi, and D. Bernhardt-Walther, "The role of symmetry in scene categorization by human observers", MODVIS: Computational and Mathematical Models in Vision, St. Petersburg, FL, May 14-16, 2017.

9. M. Rezanejad, J. Wilder, S. Dickinson, A. Jepson, D. Bernhardt-Walther, and K. Siddiqi, "Scoring Scene Symmetry", MODVIS: Computational and Mathematical Models in Vision, St. Petersburg, FL, May 14-16, 2017.

10. J. Wilder, S. Dickinson, A. Jepson, and D. Bernhardt-Walther, "Disentangling the Roles of Junctions and Spatial Relations Between Contours for Scene Categorization", MODVIS: Computational and Mathematical Models in Vision, St. Petersburg, FL, May 11-13, 2016.

9 Invited Presentations

9.1 Invited Plenary Conference/Workshop Presentations

1. "The Role of Symmetry in Human and Computer Vision", keynote speaker, IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), Luxembourg, July 14, 2021.

2. "The Role of Symmetry in Human and Computer Vision", keynote speaker, International Conference on Digital Image Computing: Techniques and Applications (DICTA), Melbourne, Australia, December 1, 2020.

3. "The Role of Symmetry in Human and Computer Vision", keynote speaker, 32nd Canadian Conference on Artificial Intelligence (CCAI), Kingston, ON, May 29, 2019.

4. "The Role of Symmetry in Human and Computer Vision", keynote speaker, British Machine Vision Conference (BMVC), Newcastle, UK, September 5, 2018.

5. "The Role of Symmetry in Human and Computer Vision", keynote speaker, Korean Conference on Computer Vision (KCCV), Seoul, July 17, 2018.

6. "The Role of Symmetry in Human and Computer Vision", keynote speaker, VISTA Innovation and Technology Conference, York University, June 26, 2018.

7. "Strengthening our Community through Mentorship, Leadership, and Inclusiveness", invited speaker, Good Citizen of CVPR Workshop, CVPR 2018, Salt Lake City, June 22, 2018.

8. "The Role of Symmetry in Human and Computer Vision", keynote speaker, Chinese Conference on Computer Vision (CCCV), Tianjin, China, October 14, 2017.

9. "The Role of Symmetry in Computer and Human Vision", invited speaker, REPARTI Strategic Network Workshop, Quebec City, June 15, 2017.

10. "Model-Based Perceptual Grouping and Shape Abstraction", invited speaker, Symposium on Probabilistic Approaches to Perceptual Organization, MathPsych 2016, New Brusnwick, NJ, August 5, 2016.

11. "Model-Based Perceptual Grouping and Shape Abstraction", invited speaker, Forty-First Annual Interdisciplinary Conference (AIC) on Cognitive Science, Breckenridge, CO, January 31, 2016.

12. "Detecting and Grouping Symmetric Parts in Cluttered Scenes", invited speaker, International Conference on Perceptual Organization, York University, Toronto, Canada, June 26, 2015.

13. "Detecting Symmetric Parts in Cluttered Scenes", invited symposium speaker, 12th Conference on Computer and Robot Vision, Halifax, Canada, June 5, 2015.

14. "Perceptual Grouping using Superpixels", keynote speaker, MODVIS 2015: Workshop on Computational and Mathematical Models in Vision, St. Petersburg, FL, May 14, 2015.

15. "Detecting and Grouping Symmetric Parts in Cluttered Scenes", invited speaker, Symposium on Symmetry: Theory and Applications", Annual Meeting of the Society for Mathematical Psychology, Quebec City, Canada, July 19, 2014.

16. "What should be the Gold-standard for evaluating symmetry detection algorithms in computer vision: human perception or mathematics?", invited panel presentation and panelist, Workshop on Symmetry Detection from Real World Images - A Competition, CVPR 2013, Portland, OR, June 23, 2013.

17. "The Main Challenges Facing Object Categorization: Perceptual Grouping and Image Abstraction", Spotlights Track: Robotics and Vision, "Challenges" category, Twenty-Sixth Conference on Artificial Intelligence (AAAI-12), Toronto, ON, July 26, 2012.

18. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", keynote speaker, 4th Mexican Congress on Pattern Recognition (MCPR), Huatulco, Mexico, June 2012.

19. "Structured Approaches to Computer Vision", invited speaker and session organizer, International Workshop on Computer Vision (IWCV), Siracusa, Sicily, May 2012.

20. "Symmetric Parts and Their Role in Object Recognition", invited speaker, CVPR 2011 Workshop on Symmetry Detection from Real World Images - A Competition, June 24, 2011.

21. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", keynote speaker, Iberian Conference on Pattern Recognition and Image Analysis (IbPRIA), Las Palmas de Gran Canaria, Spain, June 10, 2011.

22. "Symmetric Parts and Their Role in Object Recognition", invited speaker, Tutorial on Computational Symmetry: Past, Current, and Future, European Conference on Computer Vision, Crete, September 5, 2010.

23. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", keynote speaker, 7th IEEE Workshop on Perceptual Organization in Computer Vision, San Francisco, June 13, 2010.

24. "The Evolution of Object Categorization and the Challenge of Shape Abstraction", invited speaker, Dagstuhl Seminar on Form and Function, October 18–23, 2009.

25. "Symmetric Part Abstraction from Real Images", invited speaker, Workshop on Trends in Computer Vision, Prague, July 27–29, 2009.

26. "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.

27. "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.

28. "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.

29. "Generic Object Recognition and the Need for Image Abstraction", keynote speaker, Visual Computing Workshop, DePaul University, May 21, 2004.

30. "Many-to-Many Feature Matching in Object Recognition", invited speaker, Dagstuhl Seminar on Cognitive Vision Systems, October 28, 2003.

31. "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, Heijen, Netherlands, June 4–6, 2003.

32. "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.

33. "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.

34. "Generic Model Abstraction from Examples", invited speaker, Stockholm (Rosenon) Workshop on Computational Vision, August 2, 2001.

35. "A Unified Framework for Indexing and Matching Hierarchical Shape Structures", keynote speaker, 4th International Workshop on Visual Form, Capri, Italy, May 30, 2001.

36. "Vision for the Disabled: Navigation and Recognition", invited speaker, Dagstuhl Seminar on Modelling of Sensor-Based Intelligent Robot Systems, October 20, 2000.

37. "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.

38. "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.

39. "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.

40. "View-Based 3-D Object Recognition Using Saliency Regions", invited speaker, Dagstuhl Seminar on Knowledge-Based Computer Vision, December 10, 1997.

41. "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.

42. "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.

43. "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.

44. "Functional Components", invited speaker, Workshop on the Role of Functionality in Object Recognition, CVPR '94, Seattle, June 20, 1994,

45. "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.

9.2   Invited University/Institute Lectures

46. "The Role of Symmetry in Human and Computer Vision", Voxel51 Computer Vision Meet-Up, May 11, 2023.

47. "The Role of Symmetry in Human and Computer Vision", Department of Artificial Intelligence, Dongguk University, Seoul, Korea, Sept 30, 2022.

48. "The Role of Symmetry in Human and Computer Vision", Distinguished Researcher Lecture Series Webinar, Agency for Science, Technology and Research (A*), Singapore, March 2, 2022.

49. "The Role of Symmetry in Human and Computer Vision", Department of Computer Science, University of Pittsburgh, November 13, 2020.

50. "The Role of Symmetry in Human and Computer Vision", Department of Computer Science, University of South Florida, November 6, 2020.

51. "Future-Ready? Understanding AI's Future Impact", Joint Empire Club of Canada/University of Toronto, November 26, 2018.

52. "The Role of Symmetry in Human and Computer Vision", Department of Psychology, University of Southern California, September 21, 2017.

53. "The Role of Symmetry in Human and Computer Vision", Department of Computer Science, University of Southern California, September 22, 2017.

54. "The Perceptual Advantage of Symmetry for Scene Perception", Department of Cognitive Science Colloquium Series, University of California at Irvine, July 18, 2017.

55. "The Perceptual Advantage of Symmetry for Scene Perception", Center for Vision Research, York University, June 23, 2017.

56. "The Perceptual Advantage of Symmetry for Scene Perception", Max Planck Institute for Intelligent Systems, May 29, 2017.

57. "The Perceptual Advantage of Symmetry for Scene Perception", Frankfurt Institute of Advanced Studies and J.W. Goethe University, Frankfurt, May 26, 2017.

58. "The Perceptual Advantage of Symmetry for Scene Perception", Department of Computer Science, University of South Florida, May 22, 2017.

59. "The Perceptual Advantage of Symmetry for Scene Perception", Center for Automation Research, University of Maryland, April 19, 2017.

60. "The Perceptual Advantage of Symmetry for Scene Perception", invited speaker, Bodian Seminar Lecture Series at the Krieger Mind/Brain Institute at Johns Hopkins University, April 17, 2017.

61. "The Role of Symmetry in Human and Computer Vision", invited colloquium, Department of Computer Science, Brigham Young University, April 13, 2017.

62. "The Perceptual Advantage of Symmetry for Scene Perception", Center for Intelligent Machines, McGill University, March 30, 2017.

63. "The Perceptual Advantage of Symmetry for Scene Perception", Department of Psychology, University of California at Santa Barbara (UCSB), February 23, 2017.

64. "The Perceptual Advantage of Symmetry for Scene Perception", Department of Psychology, Stanford University, February 17, 2017.

65. "Model-Based Perceptual Grouping and Shape Abstraction", Department of Computer Science, Stanford University, November 3, 2016.

66. "Model-Based Perceptual Grouping and Shape Abstraction", Institute for Robotics and Intelligent Systems (IRIS), University of Southern California, January 22, 2016.

67. "Perceptual Grouping using Superpixels", Amazon Research, Seattle, November 11, 2015.

68. "Model-Based Perceptual Grouping and Shape Abstraction", Centre for Vision Research, York University, April 8, 2015.

69. "Model-Based Perceptual Grouping and Shape Abstraction", Department of Computer Science, University of California, Santa Barbara, February 16, 2015.

70. "3-D Shape Abstraction from a Single 2-D Image", Department of Computer Science Colloquium, Rutgers University, December 9, 2014.

71. "Perceptual Grouping using Superpixels", Perceptual Science Series, Rutgers Center for Cognitive Science (RuCCS), Rutgers University, December 8, 2014.

72. "Tribute to Azriel", Workshop Commemorating the 50th Anniversary of CfAR and the 10th Anniversary of the Passing of Azriel Rosenfeld, Department of Computer Science, University of Maryland, November 17, 2014.

73. "Perceptual Grouping using Superpixels", Applied Informatics Group, University of Bielefeld, September 4, 2014.

74. "Perceptual Grouping using Superpixels", Cognitive Systems Engineering Lab (GET), Faculty of Computer Science, University of Paderborn, September 3, 2014.

75. "Perceptual Grouping using Superpixels", Frankfurt Institute of Advanced Studies and J.W. Goethe University, Frankfurt, November 14, 2013.

76. "Perceptual Grouping using Superpixels", Department of Computer Science, Technical University of Darmstadt, November 13, 2013.

77. "Perceptual Grouping using Superpixels", Heidelberg Collaboratory for Image Processing (HCI), University of Heidelberg, November 12, 2013.

78. "Perceptual Grouping using Superpixels", Max Planck Institute for Intelligent Systems, Tübingen, November 11, 2013.

79. "Perceptual Grouping using Superpixels", Computer Vision Laboratory, Department of Computer Science, University of Maryland, July 25, 2013.

80. "Perceptual Grouping using Superpixels", Department of Computer Science, George Mason University, July 23, 2013.

81. "Perceptual Grouping using Superpixels", Department of Computer Science, McGill University, March 22, 2013.

82. "Perceptual Grouping using Superpixels", Department of Electrical Engineering and Computer Science, University of Michigan, December 7, 2012.

83. "Perceptual Grouping using Superpixels", Department of Electrical Engineering and Computer Science, University of Central Florida, August 2, 2012.

84. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", Department of Computer Science, University of British Columbia, May 4, 2012.

85. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", Robotics and Intelligent Machines (RIM) Seminar, Georgia Institute of Technology, February 29, 2012.

86. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", Department of Computer Science and Engineering, University of South Florida, October 7, 2011.

87. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", Intelligent Systems Lab, Informatics Institute, University of Amsterdam, August 31, 2011.

88. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", Max-Planck Institute fur Informatik, Saarbrucken, August 29, 2011.

89. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", Technical University of Munich Informatik-Kolloquium, August 26, 2011.

90. "The Evolution of Object Categorization and the Challenge of Image Abstraction", Department of Computer Science and Engineering, University of Notre Dame, April 7, 2011.

91. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", Department of Computer Science, University of Southern California, March 31, 2011.

92. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", Department of Computer Science and Engineering, University of California at Riverside, March 11, 2011.

93. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", Department of Computer Science, University of California at Los Angeles, March 10, 2011.

94. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", Department of Computer Science, California Institute of Technology, March 9, 2011.

95. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", Department of Computer Science Colloquium, University of Arizona, January 13, 2011.

96. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", Department of Computer Science Colloquium, University of California at Santa Barbara, October 6, 2010.

97. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", Tsinghua National Laboratory for Information Science and Technology, Department of Automation, Tsinghua University, Beijing, August 26, 2010.

98. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", National Key Laboratory for Machine Perception, Department of Machine Intelligence, Peking University, Beijing, August 24, 2010.

99. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", Visual Computing Group, Microsoft Research Asia, Beijing, August 23, 2010.

100. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", Center for Imaging Science, Johns Hopkins University, April 20, 2010.

101. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", Faculty of Science, University of Ontario Institute of Technology (UOIT), April 7, 2010.

102. "The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction", Center for Vision Research, York University, March 26, 2010.

103. "Object Categorization and the Need for Many-to-Many Matching", Department of Computer Science, Technical University Darmstadt, October 23, 2009.

104. "Object Categorization and the Need for Many-to-Many Matching", Department of Computer Science, University of California at Santa Barbara, March 12, 2009.

105. "Object Categorization and the Need for Many-to-Many Matching", Department of Computer Science, University of Western Ontario, November 28, 2008.

106. "Object Categorization and the Need for Many-to-Many Matching", GRASP Laboratory Colloquium, University of Pennsylvania, April 25, 2008.

107. "Learning Structured Appearance Models from Captioned Images of Cluttered Scenes", Department of Computer Science Colloquium, Drexel University, April 24, 2008.

108. "Object Categorization and the Need for Many-to-Many Matching", Electrical and Computer Engineering Department, North Carolina State University, January 25, 2007.

109. "Object Categorization and the Need for Many-to-Many Matching", McGill Colloquium, School of Computer Science, McGill University, November 9, 2007.

110. "Learning Structured Appearance Models from Captioned Images of Cluttered Scenes", Center for Machine perception, Czech Technical University Prague, June 28, 2007.

111. "Generic Object Recognition and the Need for Many-to-Many Matching", Department of Computer Science, Boston University, November 16, 2006.

112. "Generic Object Recognition and the Need for Many-to-Many Matching", Department of Computer Science Colloquium Series, Tufts University, November 15, 2006.

113. "Generic Object Recognition and the Need for Many-to-Many Matching", Department of Electrical and Computer Engineering, Queen's University, October 20, 2006.

114. "Generic Object Recognition and the Need for Many-to-Many Matching", Special Learning & Memory/Cognitive Colloquium, Purdue University, IN, January 11, 2006.

115. "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.

116. "Generic Object Recognition and the Need for Many-to-Many Matching", Special Learning & Memory/Cognitive Colloquium, Purdue University, IN, January 11, 2006.

117. "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.

118. "Many-to-Many Feature Matching in Object Recognition", Center for Machine Perception, Faculty of Applied Computer Science, University of Bielefeld, Germany, June 21, 2004.

119. "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.

120. "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.

121. "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.

122. "A Unified Framework for Indexing and Matching Hierarchical Shape Structures", Department of Computer Science, Brown University, March 11, 2003.

123. "Generic Model Abstraction from Examples", Center for Vision Research, York University, January 17, 2003.

124. "Generic Model Abstraction from Examples", Computer Vision Colloquium Series, Departments of Electrical Engineering and Computer and Information Science, Ohio State University, November 7, 2002.

125. "Generic Model Abstraction from Examples", Biomedical Imaging Group, Department of Biomedical Engineering, Technical University of Eindhoven, October 2, 2002.

126. "A Unified Framework for Indexing and Matching Hierarchical Shape Structures", Department of Biomedical Engineering, Technical University of Eindhoven, September 30, 2002.

127. "Shape Matching and Indexing in Medical Imaging", Mount Sinai Department of Pathology, May 13, 2002.

128. "Bridging the Representational Gap in Computer Vision", Department of Computer Science, University of Central Florida, April 15, 2002.

129. "A Spectral Encoding of Tree Structure and its Application to Shape Indexing and Matching", Institute of Photogrammetry, University of Bonn, August 7, 2000.

130. "The Fall and Rise of Generic Object Recognition", University of Bielefeld, Germany, May 22, 2000.

131. "Generic Shape Indexing and Matching for 2-D Object Recognition", Department of Physiology, University of Bergen, Norway, June 11, 1999.

132. "Generic Shape Indexing and Matching for 2-D Object Recognition", Department of Computer Science, University of Toronto, Toronto, Canada, May 10, 1999.

133. "Generic Shape Indexing and Matching for 2-D Object Recognition", Department of Computer Science, York University, Toronto, Canada, March 16, 1999.

134. "Generic Shape Indexing and Matching for 2-D Object Recognition", Department of Computer Science, University of Waterloo, February 3, 1999.

135. "Generic Shape Indexing and Matching for 2-D Object Recognition", Department of Computer Science and Engineering, University of South Florida, October 26, 1998.

136. "Generic Shape Indexing and Matching for 2-D Object Recognition", Royal Institute of Technology (KTH), Stockholm, Sweden, May 27, 1998.

137. "Towards Generic 3-D Object Recognition", University of Bielefeld, Germany, May 21, 1998.

138. "Generic Shape Indexing and Matching for 2-D Object Recognition", University of Bielefeld, Germany, May 20, 1998.

139. "Generic Shape Indexing and Matching for 2-D Object Recognition", Sarnoff Corporation, April 21, 1998.

140. "View-Based Shape Matching", Department of Computer Science, University of Kentucky, October 23, 1997.

141. "View-Based Shape Matching", Department of Computer Science, McGill University, September 26, 1997.

142. "Object Recognition in a Dynamic Environment", Department of Electrical and Computer Engineering, University of California at Santa Barbara, March 21, 1997.

143. "Object Recognition in a Dynamic Environment", Department of Biomedical Engineering, Rutgers University, September 30, 1996.

144. "Object Recognition in a Dynamic Environment", NEC Research Labs, Princeton, NJ, April 4, 1996.

145. "Object Recognition in a Dynamic Environment", Department of Computer Science, Columbia University, March 20, 1996.

146. "Object Recognition in a Dynamic Environment", Department of Electrical Engineering and Computer Science, Yale University, February 23, 1996.

147. "Object Recognition in a Dynamic Environment", Siemens Research Laboratory, Princeton, NJ, February 7, 1996.

148. "Getting Your Computer to Recognize Three-Dimensional Objects", RuCCS "What is Cognitive Science?" Colloquium Series, Rutgers University, November 2, 1995.

149. "Integrating Qualitative and Quantitative Shape Recovery", Department of Psychology "Visionaries" Colloquium, Rutgers University, October 7, 1994.

150. "Integrating Qualitative and Quantitative Shape Recovery", Computational Vision and Active Perception Laboratory, Royal Institute of Technology (KTH), Stockholm, Sweden, May 11, 1994.

151. "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.

152. "Integrating Qualitative and Quantitative Shape Recovery", Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, MI, April 15, 1994.

153. "Integrating Qualitative and Quantitative Shape Recovery", Xerox PARC Image Understanding Group, Palo Alto, CA, March 24, 1994.

154. "An Introduction to Object Recognition by Computer", Department of Computer Science, Mills College, Oakland, CA, March 23, 1994.

155. "Integrating Qualitative and Quantitative Shape Recovery", Department of Computer Science, York University, Toronto, Ontario, March 4, 1994.

156. "Integrating Qualitative and Quantitative Shape Recovery", Department of Computer Science, University of New Brunswick, Canada, February 16, 1994.

157. "Integrating Qualitative and Quantitative Shape Recovery", Computer Vision Group, Computing Science Center, University of Geneva, Geneva, Switzerland, August 26, 1993.

158. "Integrating Qualitative and Quantitative Visual Shape Recovery", Department of Computer Science, University of Toronto, May 6, 1993.

159. "Decoupling Object Recognition and Object Localization", Departments of Computer Science and Psychology, University of Southern California, February 12, 1993.

160. "Coarse-To-Fine Object Recognition", Department of Electronic and Electrical Engineering, University of Surrey, Surrey, UK, September 21, 1992.

161. "The Recovery and Recognition of Three-Dimensional Objects using Part-Based Aspect Matching", Department of Computer Science, York University, Toronto, Canada, December 18, 1991.

162. "From Volumes to Views: An Approach to 3-D Object Recognition", Department of Computer Science, University of Toronto, Toronto, Canada, April 15, 1991.

163. "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.

9.3   Invited Non-Academic Lectures

164. "A Vision for AI at Samsung", 2018 Korea-Canada Business Forum, Toronto, ON, June 27, 2018.

9.4   Invited Posters

165. S. Fidler, S. Dickinson, and R. Urtasun, "3D Object Detection and Viewpoint Estimation with a Deformable 3D Cuboid Model", invited poster, SUNw: Scene Understanding Workshop, CVPR, Portland OR, June 23, 2013.

9.5   Invited Lectures/Courses in Educational Forums

166. "The role of Symmetry and Human and Robot Vision", Senior Common Room Talk, University College, University of Toronto, December 4, 2017.

167. "Vision in Humans and Machines", invited talk, Santa Barbara High School Computer Science Academy, April 12, 2016.

168. "Building Machines that Understand What They See", invited talk, Computing Insights 2007, Department of Computer Science, University of Toronto, July 12, 2007.

169. "Graph Matching and Object Recognition", invited course, Copenhagen Image and Signal Processing Graduate School, IT University, Denmark, May 26-29, 2003.

170. "Object Representation and Recognition", Computing Insights 2001, Department of Computer Science, University of Toronto, July 11, 2001.

171. "Object Representation and Recognition", DIMACS Reconnect Two Day Workshop for Two Year College Teachers, Rutgers University, May 22, 1999.

172. "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.

173. "3-D Shape Recovery Using Distributed Aspect Matching", invited speaker, Scottish Universities Summer School in Physics, University of Dundee, Dundee, Scotland, August 15, 1990.

10   External Service

10.1   Conference/Workshop Leadership

1. Co-Chair, ICCV Workshop on Sketching for Human Expressivity, ICCV 2021, Montreal, QC, October 2021.

2. Co-Chair, Workshop on Hybrid Artificial Intelligence, Thirty-Fifth AAAI Conference on Artificial Intelligence (AAAI-21), Vancouver, February 2021.

3. General Co-Chair, IEEE WACV, Waikoloa, HI, January 2019.

4. Co-Chair, Workshop on Detecting Symmetry in the Wild, International Conference on Computer Vision (ICCV), Venice, October 2017.

5. Area Chair, International Conference on Computer Vision (ICCV), Santiago Chili, December 2015.

6. Co-Chair, Workshop in Celebration of Larry Davis, Cape Cod, MA, June 10-12, 2015.

7. General Co-Chair, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Columbus, OH, June 2014.

8. Workshop Co-Chair, Fourth International Workshop on Shape Perception in Human and Computer Vision, Naples, FL, May 2011.

9. Area Chair, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Colorado Springs, CO, June 2011.

10. Workshop Co-Chair, Third International Workshop on Shape Perception in Human and Computer Vision, Crete, Greece, September 2010.

11. Area Chair, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), San Francisco, CA, June 2010.

12. Workshop Co-Chair, Second International Workshop on Shape Perception in Human and Computer Vision, Regensburg, Germany, August 2009.

13. Workshop Co-Chair, First International Workshop on Shape Perception in Human and Computer Vision, Marseille, October 2008.

14. Track Co-Chair (Computer Vision), International Conference on Pattern Recognition (ICPR), Tampa, FL, August 2008.

15. Workshops Chair, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Anchorage, June 2008.

16. 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.

17. Co-Chair, IEEE Workshop on Generic Object Recognition, Corfu, Greece, September 1999.

18. Co-Chair, IEEE Workshop on Generic Object Recognition and Categorization, Washington, D.C., June 2004.

19. Area Chair (Object Recognition), IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Washington, D.C., June 2004.

20. Area Chair (Object Recognition), IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Madison, Wisconsin, June 2003.

21. Co-Chair, DIMACS Workshop on Graph-Theoretic Methods in Computer Vision, DIMACS, Rutgers University, May 1999.

22. Area Chair (Model Acquisition), IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Fort Collins, CO, June 1999.

23. Vice Chair of Program Committee, 9th International Conference on Tools with Artificial Intelligence, Newport Beach, November 1997.

24. Co-Chair, IEEE Workshop on Generic Object Recognition, San Juan, Puerto Rico, June 1997.

10.2 Other Leadership

1. Member, Computing Research Association (CRA) Research Integrity Committee, 2021.

2. Member, Editor-in-Chief Search Committee, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 2021.

3. Member, IAPR Fellow Committee, 2021–2023.

4. Member, CVPR 2019 Best Paper Awards Committee.

5. Member, External Review Committee, School of Computer Science and Technology (SCST), Tianjin University, May 15-17, 2018.

6. Member, CS-CAN Research Committee, March 2017–March 2018.

7. Member, International Association of Pattern Recognition (IAPR) Membership Committee, 2013–present.

8. Member, Ad Hoc Committee charged by the PAMI-TC with looking into the possibility of adopting an Open Access (OA) publication policy for CVPR and ICCV, 2012–2013.

9. Standing Committee Member, IAPR (International Association for Pattern Recognition) ICPR (International Conference on Pattern Recognition), 2008–2010.

10. Vice Chair, International Association for Pattern Recognition (IAPR) Technical Committee #15 (Graph-Based Representations in Pattern Recognition), 2007–2011.

11. Member, Editor-in-Chief Reappointment Committee, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 2006.

12. Member, International Association of Pattern Recognition Technical Committee 15, Graph-Based Representations in Pattern Recognition, 2005–2005.

10.3 Program Committees

1. Program Committee Member, 5th International IEEE Workshop on 3D Representation and Recognition (3dRR-15), Santiago, Chile, December, 2015.

2. Program Committee Member, Twenty-Ninth National Conference on Artificial Intelligence (AAAI), Austin, TX, January 2015.

3. Program Committee Member, Second Workshop on Affordances: Visual Perception of Affordances and Functional Visual Primitives for Scene Analysis (in conjunction with ECCV 2014), September 7, 2014, Zurich, Switzerland.

4. Program Committee Member, 6th Mexican Congress on Pattern Recognition (MCPR), Cancun, Mexico, June 2014.

5. Program Committee Member, 4th International IEEE Workshop on 3D Representation and Recognition (3dRR-13), Sydney, December, 2013.

6. Program Committee Member, 5th Mexican Congress on Pattern Recognition (MCPR), Queretaro, Mexico, June 2013.

7. Program Committee Member, ICCV Workshop on 3D Representation and Recognition, Barcelona, Spain, Nov 7, 2011.

8. Program Committee Member, European Conference on Computer Vision (ECCV), Crete, Greece, September, 2010.

9. Program Committee Member, ECCV 2010 Workshop on 'Vision for Cognitive Tasks', Crete, Greece, September 2010.

10. Program Committee Member, 7th IEEE Workshop on Perceptual Organization in Computer Vision, San Francisco, June 2010.

11. Program Committee Member, Workshop on Visual and Contextual Learning from Annotated Images and Videos, Miami, FL, June 2009.

12. Program Committee Member, International Workshop on Graph-Based Representations for Pattern Recognition, Venice, Italy, May 2009.

13. Program Committee Member, European Conference on Computer Vision, Marseille, October 2008.

14. Program Committee Member, 6th IEEE Workshop on Perceptual Organization in Computer Vision, Anchorage, June 2008.

15. Program Committee Member, International Conference on Computer Vision (ICCV), Rio de Janeiro, October, 2007.

16. Program Committee Member, EMMCVPR 2007, Lotus Hill Institute, China, August 2007.

17. Program Committee Member, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Minneapolis, MN, June 2007.

18. Program Committee Member, International Workshop on Graph-Based Representations for Pattern Recognition, Alicante, Spain, June 2007.

19. Program Committee Member, International Conference on Computer Vision Systems, Bielefeld, Germany, March 2007.

20. Program Committee Member, Canadian Conference in Computer and Robot Vision (CRV), Quebec City, June 2006.

21. Program Committee Member, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), New York, NY, June 2006.

22. Program Committee Member, European Conference on Computer Vision (ECCV), Graz, May 2006.

23. Program Committee Member, IEEE International Conference on Computer Vision (ICCV), Bejing, September 2005.

24. 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.

25. Program Committee Member, 2nd IEEE Workshop on Vision for Human Computer Interaction, New York, NY, June 2006.

26. Program Committee Member, 1st International Conference on Computer Vision Theory and Applications (VISAPP), Setubal, Portugal, February 2006.

27. Program Committee Member, IEEE International Conference on Mechatronics and Automation, Niagara Falls, ON, July 2005.

28. Program Committee Member, IEEE Workshop on Vision for Human-Computer Interaction, San Diego, June 2005.

29. Program Committee Member, Canadian Conference on Computer and Robot Vision (CRV), Victoria, B.C., May 2005.

30. Program Committee Member, IEEE Workshop on Vision for Human-Computer Interaction, in conjunction with CVPR 2005, San Diego, June 2005.

31. Program Committee Member, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), San Diego, CA, June 2005.

32. Program Committee Member, 4th Indian Conference on Computer Vision, Graphics and Image Processing, Kolkata, December 2004.

33. Program Committee Member, International Conference on Pattern Recognition (ICPR), Cambridge, U.K., August 2004.

34. Program Committee Member, International Workshop on Structural and Syntactic Pattern Recognition (SSPR), Lisbon, August 2004.

35. Member, Steering Committee, York University Center for Vision Research, 2003–2005.

36. 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.

37. Program Committee Member, 25th German Conference on Artificial Intelligence (KI-2002), September 2002, Aachen, Germany.

38. Program Committee Member, International Conference on Pattern Recognition (ICPR), Quebec City, Canada, August 2002.

39. Program Committee Member, International Workshop on Structural and Syntactic Pattern Recognition (SSPR), Windsor, Canada, August 2002.

40. Program Committee Member, IEEE International Conference on Computer Vision (ICCV), Vancouver, B.C., July 2001.

41. Program Committee Member, Workshop on Statistical and Computational Theories of Vision: Modeling, Learning, Computing, and Sampling, Vancouver, B.C., July 2001.

42. Program Committee Member, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Hilton Head, SC, June 2000.

43. Program Committee Member, IEEE International Conference on Computer Vision (ICCV), Corfu, Greece, September 1999.

44. Program Committee Member, International Workshop on Graph Algorithms and Computer Vision, Corfu, Greece, September 1999.

45. Program Committee Member, Workshop on Statistical and Computational Theories of Vision: Modeling, Learning, Computing, and Sampling, Fort Collins, CO, June 1999.

46. Program Committee Member, Thirteenth National Conference on Artificial Intelligence (AAAI), Portland, OR, August 1996.

47. Program Committee Member, 13th International Conference on Pattern Recognition (ICPR), Vienna, Austria, August 1996.

48. Program Committee Member, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), San Francisco, June 1996.

49. Program Committee Member, Workshop on Spatial and Temporal Interaction: Representation and Reasoning, International Conference on Automation, Robotics, and Computer Vision, Singapore, Nov 1994.

10.4 University Service

1. Chair, Space Committee, Department of Computer Science, University of Toronto, 2023–2024.

2. Member, DCS Turns 60 Planning Committee, 2023–2024.

3. Member, FTE Reduction Working Group, 2023–2024.

4. Member, Working Group on MScAC AI Concentration, Department of Computer Science, University of Toronto, 2021–2022.

5. Member, Panel on Equity, Diversity, and Inclusion, Department of Computer Science, University of Toronto, 2021–2022.

6. Member, Space Committee, Department of Computer Science, University of Toronto, 2021–2022, 2022–2023.

7. Member, Industrial Partnerships Bench, Department of Computer Science, University of Toronto, 2021–2022.

8. Member, Mock Reviewing Team, VISTA Midterm Review, York University, 2021.

9. Member, Department of Computer Science Data Science Workgroup, University of Toronto, 2020.

10. Member, Chair Search Committee, Department of Computer Science, University of Toronto, 2020.

11. Member, Planning and Budget Committee, Department of Computer Science, University of Toronto, 2019–2020, 2020–2021, 2021–2022, 2022-2023, 2023–2024.

12. Member, Chair Search Committee, Department of Computer Science, University of Toronto, 2019.

13. Member, Min Specs Working Group for Vector 1000AIMs Initiative, Vector Institute, 2018.

14. Member, Information Security Council (ISC), University of Toronto, 2018.

15. Member, Advisory Committee on the University of Toronto Library System, University of Toronto, 2017–18.

16. Member, Undergraduate Planning and Growth Working Group, Department of Computer Science, University of Toronto, 2018.

17. Member, UTM Robotics Faculty Recruiting Commmittee, Department of Computer Science, University of Toronto, 2017–2018.

18. Member, Undergraduate Planning and Growth Committee, Department of Computer Science, University of Toronto, 2017-2018.

19. Member, Teaching Credit Committee, Department of Computer Science, University of Toronto, 2017-2018.

20. Chair, Dean's Advisory Committee on Information Technology (DACIT), University of Toronto, 2016–2017.

21. Member, Advisory Committee on the University of Toronto Library System, University of Toronto, 2016–17.

22. Member, UTM Robotics Faculty Recruiting Commmittee, Department of Computer Science, University of Toronto, 2016–2017.

23. Member, Senior Promotions Committee, Department of Computer Science, University of Toronto, 2016–2017.

24. Member, Robotics Strategic Planning Committee, University of Toronto, 2016–2017.

25. Member, Engineering Science AI Program Committee, University of Toronto, 2016–2017.

26. Chair Advancement Committee, Department of Computer Science, University of Toronto, 2011–2012, 2012–2013, 2013–2014, 2014–2015.

27. Chair, Department of Computer Science, University of Toronto, 2010–2015.

28. Co-Chair, Dean's Cyber-risk Committee, Faculty of Arts and Science, University of Toronto, 2014–2015.

29. Member, Selection Committee, Canada First Research Excellence Program (CFREF), University of Toronto, 2014–2015.

30. Member, eCommunication and eCollaboration RFP Selection Committee to select UofT's email/e-communications platform, 2014–2015.

31. Member, Working Group on Information Risk Management Practice, University of Toronto, 2014–2015.

32. Member, Budget Subcommittee on OTO Budget Cuts, Faculty of Arts and Science, University of Toronto, 2014–2015.

33. Chair, Communications Advisory Group, Department of Computer Science, University of Toronto, 2014–2015.

34. Co-Chair, Faculty Recruiting Committee, Department of Computer Science/Donnelly Centre for Cellular and Biomolecular Research (joint position), University of Toronto, 2014–2015.

35. Member, Chair Search Committee, Department of Psychology, University of Toronto, 2014.

36. Member, Director Search Committee, Cognitive Science Program, University College, University of Toronto, 2014.

37. Member, Search Committee, FAS Manager, Faculty Budget and Finance, Faculty of Arts and Science, University of Toronto, 2013–2014.

38. Member, Faculty Budget Committee, Faculty of Arts and Science, University of Toronto, 2013–2014, 2014–2015.

39. Member, Special Joint Advisory Committee (SJAC) Strategy and Communications Advisory Group, University of Toronto, 2013–2014.

40. Member, Special Joint Advisory Committee (SJAC) on the Memorandum of Agreement, University of Toronto, 2013–2014.

41. Member, Focus Group in support of Special Joint Advisory Committee on the Memorandum of Agreement, University of Toronto, 2013–2014.

42. Member, Advisory Search Committee for the Dean of the School of Graduate Studies, University of Toronto, 2013–2014.

43. Member, Graduate Advisory Committee, Faculty of Arts and Science, University of Toronto, 2013–2014.

44. Chair, Senior Promotions Committee, Department of Computer Science, University of Toronto, 2011–2012, 2012–2013, 2013–2014, 2014–2015, 2016–2017. Chair Advancement Committee, Department of Computer Science, University of Toronto, 2011–2012, 2012–2013, 2013–2014, 2014–2015.

45. Chair, Planning and Budget Committee, Department of Computer Science, University of Toronto, 2011–2012, 2012–2013, 2013–2014, 2014–2015.

46. Chair, PTR Committee, Department of Computer Science, University of Toronto, 2011–2012, 2012–2013, 2013–2014, 2014–2015.

47. Chair, Chair's Discretionary Graduate Fund Committee (CDGFC), Department of Computer Science, University of Toronto, 2011–2012, 2012–2013, 2013–2014, 2014–2015.

48. Member, Faculty Recruiting Committee, Department of Mathematical and Computational Sciences, University of Toronto at Mississauga, 2013–2014.

49. Member, Lecturer Recruiting Committee, Department of Computer Science, University of Toronto, 2013–2014.

50. Member, Faculty Recruiting Committee, Department of Computer Science, University of Toronto, 2012–2013, 2013–2014.

51. Member, Dean's Excellence and Small Group Awards Committee, Faculty of Arts and Science, University of Toronto, 2011–2012, 2012–2013.

52. Member, Board of Directors, University of Toronto Collaborative Program in Neuroscience (CPIN), 2013–present.

53. Member, Interview Panel for Manager, Faculty Budget and Finance, Office of Finance, Faculty of Arts and Science, University of Toronto, 2012–2013.

54. Member, Steering Committee of the Center for Urban Science and Progress (CUSP), 2012–2013.

55. UTFA Workload Policy Advisory Committee, Faculty of Arts and Science, 2011–2012.

56. CUPE Unit 1 Bargaining Advisory Committee, Faculty of Arts and Science, 2011–2012.

57. Chair, Space Committee, Department of Computer Science, University of Toronto, 2009–2010.

58. Member, Senior Promotions Committee, Department of Computer Science, University of Toronto, 2009–2010.

59. Member, Digital Media CFI Planning Committee, 2009–2010.

60. Member, Search Committee for the Barbara G. Stymiest Chair in Rehabilitation Technology Research, University of Toronto, 2009–2010.

61. Acting Chair, Department of Computer Science, University of Toronto, 2008–2009.

62. Chair, Senior Promotions Committee, Department of Computer Science, University of Toronto, 2008–2009.

63. Chair, Planning and Budget Committee, Department of Computer Science, University of Toronto, 2008–2009.

64. Chair, PTR Committee, Department of Computer Science, University of Toronto, 2008–2009.

65. Co-Chair, Teaching Load Restructuring Committee, Department of Computer Science, University of Toronto, 2008–2009.

66. Co-Chair, Graduate Research Skills Committee, Department of Computer Science, University of Toronto, 2008–2009.

67. Member, Faculty Recruiting Committee, Department of Computer Science, University of Toronto, 2008–2009.

68. Member, International Recruitment Working Group, Faculty of Arts and Science, University of Toronto, 2008–2009.

69. Member, Department of Computer Science Time Pressures Committee, 2007–2008.

70. Member, Newsletter Advisory Committee, Department of Computer Science, University of Toronto, 2007-2008.

71. Chair, Space Committee, Department of Computer Science, University of Toronto, 2006–2007, 2007–2008.

72. Vice Chair, Department of Computer Science, University of Toronto, 2003–2006.

73. Member (ex officio), Budget and Planning Committee, Department of Computer Science, University of Toronto, 2005–2006.

74. Member (ex officio), Departmental Space Committee, Department of Computer Science, University of Toronto, 2005–2006.

75. Chair, Departmental Awards Committee, Department of Computer Science, University of Toronto, 2004–2005, 2005–2006.

76. Member (ex officio) PTR Committee, Department of Computer Science, University of Toronto, 2003–2004, 2004–2005, 2005–2006.

77. Member (ex officio) Faculty Recruiting Committee, Department of Computer Science, University of Toronto, 2004–2005.

78. Member (ex officio), Faculty Support Staff Selection Committee, Department of Computer Science, University of Toronto, 2004–2005.

79. Member (ex officio), Departmental Computing Committee, Department of Computer Science, University of Toronto, 2003–2004, 2004–2005, 2005–2006.

80. Member (ex officio), Graduate Office Manager Selection Committee, Department of Computer Science, University of Toronto, 2003–2004.

81. Member (ex officio), Chief Administrative Officer Selection Committee, Department of Computer Science, University of Toronto, 2003–2004, 2005–2006.

82. Member (ex officio), Faculty Advisory Committee, Department of Computer Science, University of Toronto, 2003–2004.

83. Member (ex officio), Graduate Office Manager Selection Committee, Department of Computer Science, University of Toronto, 2004–2005, 2005–2006.

84. Chair, University of Toronto Bell University Laboratory (BUL) Chair Search Committee, 2006.

85. Member, University of Toronto Bell University Laboratory (BUL) Grants Selection Committee, 2004–2005, 2005–2006.

86. Member, Graduate Committee, Department of Computer Science, University of Toronto, 2000–2001, 2001–2002.

87. Member, Graduate Admissions Committee, Department of Computer Science, University of Toronto, 2000–2001.

88. Member, NRSA Steering Committee, Rutgers Center for Cognitive Science, 1998–1999, 1999–2000.

89. Member, Faculty of Arts and Sciences (FAS) Computer Advisory Committee, Rutgers University, 1997–1998, 1998–1999.

90. Member, New Brunswick Advisory Committee for Instructional Computing, Rutgers University 1997–1998, 1998–1999, 1999-2000.

91. Chair, Departmental Web Page Design Committee, Rutgers university Department of Computer Science, 1997–1998, 1998–1999.

92. Member, Hiring Committee, Rutgers University Department of Computer Science, 1995–1996, 1996–1997, 1997–1998, 1998–1999.

93. Member, Steering Committee for the Human-Computer Interaction Program of the Information Sciences Strategic Planning Follow-Through Committee, Rutgers University, 1996–1997, 1997–1998.

94. Member, Search Committee, Assistant Research Professor, Laboratory for Vision Research and Department of Psychology, Rutgers University, Spring 1997.

95. Member, Program Committee, Undergraduate Minor in Cognitive Science, Rutgers Center for Cognitive Science, Spring 1996.

96. Chair, Colloquium Committee, Rutgers University Department of Computer Science, 1995–1996, 1996–1997.

97. Coordinator, Rutgers University Series on Human and Computer Vision, 1994–1995, 1995–1996, 1996–1997, 1997–1998, 1998–1999, 1999–2000.

98. Member, Executive Committee, Rutgers Center for Cognitive Science, 1994–1995, 1995–1996, 1996–1997, 1997–1998, 1998–1999, 1999–2000.

99. Member, Technical Committee, Rutgers Center for Cognitive Science, 1994–1995, 1995–1996, 1996–1997, 1997–1998, 1998–1999, 1999–2000.

100. Member, Publicity Committee, Rutgers Center for Cognitive Science, 1994–1995, 1995–1996, 1996–1997, 1997–1998, 1998–1999, 1999–2000.

101. University of Maryland Representative, Image Understanding Environments Committee, DARPA, 1990–1991.

102. Graduate Student Representative, Committee to Restructure the Comprehensive Exam System, Department of Computer Science, University of Maryland, 1990–1991.

103. Graduate Student Representative, Center for Automation Research Internal Review Committee, University of Maryland, 1990–1991.

104. Graduate Student Representative, Committee to Study Student Evaluation Procedures, Computer Science Graduate Student Council, University of Maryland, 1990–1991.

11 Education

11.1 Postdoctoral Fellow Supervision

1. John Wilder (Research Associate), Department of Computer Science, University of Toronto, 2018–2021.

2. Stavros Tsokgas, Department of Computer Science, University of Toronto, 2016–2018.

3. John Wilder (Postdoctoral Fellow), Department of Computer Science, University of Toronto, 2015–2018.

4. Sanja Fidler, Department of Computer Science, University of Toronto, 2011–2012.

5. Alex Levinshtein, Department of Computer Science, University of Toronto, 2010–2011.

6. Afsaneh Fazly, Department of Computer Science, University of Toronto, 2006–2009, (co-advisor: Suzanne Stevenson).

7. Robert Sim, Department of Computer Science, University of Toronto, 2003–2005.

8. Cristian Sminchisescu, Department of Computer Science, University of Toronto, 2003–2005, (co-advisor: Allan Jepson).

9. Sven Wachsmuth, Department of Computer Science, University of Toronto, 2002–2003, (co-advisor: Suzanne Stevenson).

10. Ee-chien Chang, Rutgers University Center for Discrete Mathematics and Theoretical Computer Science (DIMACS), 1999–2000.

Ph.D. Students in Progress

1. Dylan Turpin, Department of Computer Science, University of Toronto, 2021–present.

11.1.1   Ph.D. Students Completed

1. Tristan Aumentado-Armstrong, Department of Computer Science, University of Toronto, April 2024.

2. Tom Lee, Department of Computer Science, University of Toronto, Ph.D. (co-advisor: Sanja Fidler), March 2016.

3. Stefan Mathe, Department of Computer Science, University of Toronto, Ph.D. (co-advisor: Cristian Sminchisescu), March 2015.

4. Pablo Sala, Department of Computer Science, University of Toronto, Ph.D. advisor, August 2014.

5. Alex Levinshtein, Department of Computer Science, University of Toronto, Ph.D. (co-advisor: Cristian Sminchisescu), August 2010. Received the Canadian Image Processing and Pattern Recognition Society (CIPPRS) Doctoral Dissertation Award, given annually to the top thesis in the areas covered by the Canadian Conference on Computer and Robot Vision (CRV) completed at a Canadian institution.

6. Mike Jamieson, Department of Computer Science, University of Toronto, Ph.D. (co-advisor: Suzanne Stevenson), July 2010.

7. Diego Macrini, Department of Computer Science, University of Toronto, Ph.D. (co-advisor: David Fleet), November 2009.

8. Yakov Keselman, Department of Computer Science, Rutgers University, Ph.D. advisor, March, 2005.

9. Ali Shokoufandeh, Department of Computer Science, Rutgers University, Ph.D. (co-advisor: Endre Szemeredi), August 1999.

11.1.2 M.Sc./M.Sc.A.C. Students Completed

1. Saad Saleem, Department of Computer Science, University of Toronto, M.Sc.A.C., 2021–2022.

2. Xavier Snelgrove, Department of Computer Science, University of Toronto, M.Sc., 2020-2021.

3. Dylan Turpin, Department of Computer Science, University of Toronto, M.Sc., 2021.

4. Lipai Xu, Department of Computer Science, University of Toronto, M.Sc.A.C., 2020.

5. Zhening Zhang, Department of Computer Science, University of Toronto, M.Sc.A.C., 2019.

6. David Szeto, Department of Computer Science, University of Toronto, M.Sc., 2019.

7. Charles-Olivier Dufresne-Camaro, Department of Computer Science, University of Toronto, M.Sc., 2019.

8. Tristan Aumentado-Armstrong, Department of Computer Science, University of Toronto, M.Sc., 2019.

9. Ryan Dick, Department of Computer Science, University of Toronto, M.Sc.A.C., 2018.

10. Peng Xu, Department of Computer Science, University of Toronto, M.Sc.A.C., 2017.

11. Liwen Xu, Department of Computer Science, University of Toronto, M.Sc.A.C. (co-advisor: Alex Levinshtein), 2015.

12. Amanjot Kaur, Department of Computer Science, University of Toronto, M.Sc.A.C. (co-advisor: Alex Levinshtein), 2014.

13. Sagan Bolliger, Department of Computer Science, University of Toronto, M.Sc. (co-advisor: Rich Zemel), 2014.

14. Wesley May, Department of Computer Science, University of Toronto, M.Sc. (co-advisor: Suzanne Stevenson), 2013.

15. Tom Lee, Department of Computer Science, University of Toronto, M.Sc., 2011.

16. Anatoliy Kats, Department of Computer Science, University of Toronto, M.Sc., 2009.

17. Janusz Leidgens, Department of Computer Science, Bielefeld University, M.Sc. (co-advisor: Sven Wachsmuth), 2009.

18. Gertruda Grolinger, Department of Computer Science, University of Toronto, M.Sc., 2009.

19. Alex Levinshtein, Department of Computer Science, University of Toronto, M.Sc., 2005.

20. Pablo Sala, Department of Computer Science, University of Toronto, M.Sc., 2004.

21. Aurelie Bataille, Department of Computer Science, University of Toronto, M.Sc., 2004.

22. Diego Macrini, Department of Computer Science, University of Toronto, M.Sc., 2003.

23. Cristian Sminchiscescu, Department of Computer Science, Rutgers University, M.Sc., 1999.

24. Ali Shokoufandeh, Department of Computer Science, Rutgers University, M.Sc., 1996.

11.1.3 Ph.D. Committees (internal)

1. Yun-Chun Chen, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2022.

2. Jun Gao, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2021.

3. Min Bai, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2021.

4. Huixuan Tang, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2017.

5. Jian Yao, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2016.

6. Fernando Flores-Mangas, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2014.

7. Jonathan Taylor, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2014.

8. Ady Ecker, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2010.

9. Rama Natarajan, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2009.

10. Dustin Lang, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2009.

11. Patricio Simari, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2009.

12. Xuming He, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2007.

13. Faisal Qureshi, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2006.

14. Francisco Estrada, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2004.

15. Gustavo Carneiro, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2004.

16. Thomas F. El-Maraghi, Department of Computer Science, University of Toronto, Ph.D. thesis committee member, 2002.

17. Gabriella Hristescu, Department of Computer Science, Rutgers University, Ph.D. Thesis Committee Member, August 2000.

11.1.4 Ph.D. Committees (external)

1. Qian Yu, School of Electronic Engineering and Computer Science, Queen Mary University of London, External PhD Examiner, September 2018.

2. Thomas Shortell, College of Computing and Informatics, Drexel University, PhD Committee, 2017-2018.

3. Stavros Tsogkas, Center for Visual Computing, Ecole Centrale Paris/INRIA, PhD external reviewer, 2016.

4. Vida Movahedi, Department of Computer Science, York University, PhD external examiner, April 2015.

5. Scott Helmer, Department of Computer Science, University of British Columbia, PhD external examiner, May 2012.

6. Alessio Pascucci, Dipartimento di Informatica e Sistemistica of the University of Rome "La Sapienza", PhD External Examiner, April 2011.

7. Limin Shang, Department of Electrical and Computer Engineering, Queen's University, Ph.D. external examiner, December 2009.

8. Elke Braun, Department of Computer Science, University of Bielefeld, Germany, Ph.D. thesis defense external examiner, April 2006.

9. Fatih Demirci, Department of Mathematics and Computer Science, Drexel University, Ph.D. thesis defense external committee member, December 2005.

10. Ulukbek Ibraev, School of Communication Information and Library Studies, Rutgers University, Ph.D. thesis committee member, September 2005.

11. Fatih Demirci, Department of Mathematics and Computer Science, Drexel University, Ph.D. thesis proposal external committee member, May 2004.

12. Quoc Dinh Phung, Department of Computer Science, Curtin University, Australia, Ph.D. thesis external examiner, March 2005.

13. Ulukbek Ibraev, School of Communication Information and Library Studies, Rutgers University, Ph.D. thesis proposal external committee member, February 2005.

14. Qiang Lu, Department of Computer Science and Engineering, University of Buffalo, Ph.D. thesis external examiner, July 2004.

15. Ba Tu Truong, Department of Computer Science, Curtin University, Australia, Ph.D. thesis external examiner, July 2004.

16. Nam Thanh Nguyen, Department of Computer Science, Curtin University, Australia, Ph.D. thesis external examiner, March 2003.

17. Brett Adams, Department of Computer Science, Curtin University, Australia, Ph.D. thesis external examiner, November 2002.

18. Sven Wachsmuth, der Technischen Fakultat der Universitat Bielefeld, Germany, Ph.D. thesis external examiner, September, 2001.

19. David Melcher, Department of Psychology, Rutgers University, Ph.D. thesis committee member, April 2001.

20. Keven Weber, Department of Computer Science, Curtin University, Australia, Ph.D. thesis external examiner, 1998.

21. Michael Reed, Department of Computer Science, Columbia University, Ph.D. thesis external examiner, 1998.

22. Fee-Fee Lim, Department of Computer Science, Curtin University, Australia, Ph.D. thesis external examiner, 1997.

23. Kenong Wu, Department of Electrical Engineering, McGill University, Ph.D. thesis external examiner, 1996.

24. C.P. Lam, Department of Computer Science, Curtin University, Australia, Ph.D. thesis external examiner, 1995.

25. Mike Robey, Department of Computer Science, Curtin University, Australia, Ph.D. thesis external examiner, 1994.

11.1.5 M.S. Committees (internal second reader)

1. Jiaman Li, Department of Computer Science, University of Toronto, second reader, M.Sc. project, 2019.

2. Chaoqi Wang, Department of Computer Science, University of Toronto, second reader, M.Sc. project, 2019.

3. Pan Zhang, Department of Computer Science, University of Toronto, second reader, M.Sc. project, 2017.

4. Mian Wei, Department of Computer Science, University of Toronto, second reader, M.Sc. project, 2017.

5. Yulia Eskin, Department of Computer Science, University of Toronto, second reader, M.Sc. thesis, 2011.

6. Alex Wong, Department of Computer Science, University of Toronto, second reader, M.Sc. thesis, 2010.

7. Sofia Karygianni, Department of Computer Science, University of Toronto, second reader, M.Sc. thesis, 2009.

8. Albert Rothenstein, Department of Computer Science, University of Toronto, second reader, M.Sc. thesis, 2002.

9. Tanya Ruppell, Department of Computer Science, University of Toronto, second reader, M.Sc. thesis, 2001.

10. John Midgley, Department of Computer Science, University of Toronto, second reader, M.Sc. thesis, 2001.

11. Francisco Estrada, Department of Computer Science, University of Toronto, second reader, M.Sc. thesis, 2001.

12. Jennifer Listgarten, Department of Computer Science, University of Toronto, second reader, M.Sc. thesis, 2000.

11.1.6 M.S. Committees (external)

1. Siraj Sabihuddin, Department of Electrical and Computer Engineering, University of Toronto, April, 2008.

2. Leyla Imanirads, Department of Electrical and Computer Engineering, University of Toronto, October, 2006.

3. Svetlana Stolpner, Department of Computer Science, McGill University, M.S. thesis external examiner, September, 2006.

4. Catherine Laporte, Department of Electrical & Computer Engineering, McGill University, M.E. thesis external examiner, July 2004.

5. Druva Dattatraya, Department of Mechanical and Aerospace Engineering, Rutgers University, M.Sc. Thesis Committee Member, January 2000.

6. Zhang Wei, Department of Biomedical Engineering, Rutgers University, M.Sc. Thesis Committee Member, 1996.

11.2 Undergraduate Student Research Supervision

1. Kaiqu Liang, Department of Computer Science, University of Toronto, Winter Independent Study, 2020.

2. Ryan Marten, Department of Computer Science, University of Toronto, Laidlaw Fellow summer internship advisor, 2019, 2020.

3. Carles Balsells Rodas, Department of Mathematics, Universitat Politècnica de Catalunya, undergraduate thesis supervisor, 2019.

4. Gemma Canet Tarrés, Department of Mathematics, Universitat Politècnica de Catalunya, undergraduate thesis supervisor, 2017–2018.

5. Farwa Khan, Department of Computer Engineering, University of Toronto, summer internship co-advisor, 2018.

6. James Huang, Department of Engineering Science, University of Toronto, UTEA summer internship co-advisor, 2018.

7. Dylan Turpin, Department of Computer Science, University of Toronto, DCS summer internship co-advisor, 2018.

8. Yoori Choi, Department of Computer Science, University of Toronto, summer internship co-advisor, 2018.

9. Dylan Turpin, Department of Computer Science, University of Toronto, USRA summer internship co-advisor, 2017.

10. Yueyang Zhang, Department of Computer Science, University of Toronto, UTEA summer internship co-advisor, 2017.

11. Weidong An, Department of Computer Science, University of Toronto, summer internship co-advisor, 2017.

12. Ekaterina Datsenko, Department of Computer Science, University of Toronto, Fall Independent Study, 2016.

13. Ekaterina Datsenko, Department of Computer Science, University of Toronto, summer internship advisor, 2016.

14. Ekaterina Datsenko, Department of Computer Science, University of Toronto, UTRECS summer internship co-advisor, 2015.

15. Kamyar Ghasemipour, Department of Computer Science, University of Toronto, UTRECS summer internship co-advisor, 2015.

16. Annie Ngai, Department of Engineering Science, University of Toronto, 4th year thesis co-supervisor, 2014–2015.

17. Kamyar Ghasemipour, Department of Computer Science, University of Toronto, summer internship co-advisor, 2014.

18. Jialiang Wang, Department of Computer Science, University of Toronto, summer internship co-advisor, 2014.

19. Uri Priel, Department of Computer Science, University of Toronto, NSERC USRA summer internship advisor, 2014.

20. Tal Friedman, Department of Computer Science, University of Toronto, summer internship co-advisor, 2013.

21. Ravi Trivedi, Department of Engineering Science, University of Toronto, 4th year thesis supervisor, 2012–2013.

22. Ravi Trivedi, Department of Engineering Science, University of Toronto, summer internship advisor, 2012.

23. Zoya Gavrilov, Department of Computer Science, University of Toronto, NSERC USRA summer internship advisor, 2012.

24. Zoya Gavrilov, Department of Computer Science, University of Toronto, NSERC USRA summer internship advisor, 2011.

25. Zoya Gavrilov, Department of Computer Science, University of Toronto, NSERC USRA summer internship advisor, 2010.

26. Zoya Gavrilov, Department of Computer Science, University of Toronto, summer internship advisor, 2009.

27. Yulia Eskin, Department of Computer Science, University of Toronto, NSERC summer internship advisor, 2008.

28. Gertruda Grolinger, Department of Computer Science, University of Toronto, NSERC USRA summer internship advisor, 2007.

29. Matthijs van Eede, Department of Computer Science, Technical University of Eindhoven, 4th year research internship supervisor, 2004–2005.

30. Tim van Dijk, Department of Computer Science, Technical University of Eindhoven, 4th year research internship supervisor, 2004–2005.

31. Svetlana Stolpner, Department of Computer Science, University of Toronto, summer research internship advisor, 2004.

32. Marcus Brubaker, Department of Computer Science, University of Toronto, summer research internship advisor, 2003.

33. Svetlana Stolpner, Department of Computer Science, University of Toronto, summer research internship advisor, 2003.

34. Jordan Hesse, Department of Engineering Science, University of Toronto, 4th year thesis supervisor, 2002–2003.

35. Maxim Trokhimtchouk, Department of Mathematics, University of Toronto, NSERC USRA summer internship advisor, 2002.

36. Alex Levinshtein, Department of Computer Science, University of Toronto, NSERC USRA summer internship advisor, 2002.

37. Maxim Trokhimtchouk, Department of Mathematics, University of Toronto, NSERC USRA summer internship advisor, 2001.

38. Ronak Parikh, Department of Computer Science, Rutgers University, Undergraduate Honors Thesis Advisor, 2000.

39. Carolyn Klivans, Department of Mathematics, MIT, NSF/DIMACS Research Experiences for Undergraduates (REU) Program, 1999.

40. Christopher Malon, Department of Mathematics, University of Chicago, NSF/DIMACS Research Experiences for Undergraduates (REU) Program, 1999.

41. Carolyn Klivans, Department of Mathematics, Cornell University, NSF/DIMACS Research Experiences for Undergraduates (REU) Program, 1998.

42. David Rosenberg, Department of Computer Science, Yale University, NSF/DIMACS Research Experiences for Undergraduates (REU) Program, 1997.

43. James Ezick, Department of Computer Science, SUNY Buffalo, NSF/DIMACS Research Experiences for Undergraduates (REU) Program, 1996.

44. Fernando Nuflo, Department of Computer Science, University of Toronto, 4th year project supervisor, 1994.

45. Mario Portoraro, Department of Computer Science, University of Toronto, 4th year project supervisor, 1994.

46. Martin Martin, Department of Computer Science, University of Toronto, 4th year project supervisor, 1993.

47. Ken Shih, Department of Engineering Science, University of Toronto, 4th year thesis supervisor, 1992–1993.

11.3 Curriculum Development

1. Developed a new half-year graduate course, entitled, "Shape Perception in Human and Computer Vision" (CSC2523). How shape is perceived in the human visual system can both inform and inspire how shape can be represented and recovered in a computer vision system. This interdisciplinary graduate research seminar, suitable for students in human or computer vision, examines shape perception from this dual perspective. Through a discussion of seminal research papers in both human and computer vision, the course explores both classical and current models of shape perception, along with the challenges both communities face.

2. Developed a new full-year course, entitled, "Can We Make a Robot See Like a Human?" (CSC199Y). This multidisciplinary, first-year course explores the challenge of enabling a robot to see more like a human. Students learn some of the basic mechanisms of human vision, and learn how to use basic techniques in computational thinking to model these mechanisms in a machine. A glimpse into the challenges facing human and robot vision provides a lens through which we can better understand what today's robots are capable of, how they're evolving, and what their impact on our society will be.

3. Co-developed a new experiential learning course in image understanding, revolving around group projects defined by the University of Toronto's Intelligent Assistive Technology and Systems Laboratory (IATSL).

4. 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.

5. 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.

6. 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.

7. Introduced new course into the Rutgers University Department of Computer Science's graduate curriculum: 16:198:534 Image Understanding.

8. 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.

9. 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.

11.4   Courses Offered

1. Can We Make a Robot See Like a Human? (undergraduate) (csc199Y, UofT).

2. Computational Vision II (graduate) (csc2523, UofT).

3. File Structures and Data Management (undergraduate) (csc228, UofT).

4. Introduction to Artificial Intelligence (undergraduate) (01:198:440, Rutgers).

5. Proseminar in Cognitive Science (graduate) (16:185:500, Rutgers), team-taught with other RuCCS faculty.

6. Cognitive Science: A Multidisciplinary Introduction (undergraduate, Rutgers) (01:185:201), team-taught with other RuCCS faculty.

7. Image Understanding (graduate) (01:198:534, Rutgers).

8. Introduction to Artificial Intelligence (graduate) (16:198:520, Rutgers).

9. Graduate Seminar in Computer Vision (graduate) (16:198:671, Rutgers).

12   Memberships in Professional Societies

1. Senior Member, Institute for Electrical and Electronics Engineers (IEEE), 1982–present.

2. Member, Association for Computing Machinery (ACM), 1996–present.