

# Konstantinos Derpanis, Ph.D., Associate Professor

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## Education

Ph.D., Department of Computer Science, York University, 2003 – 2010.

Dissertation: The Role of Representation in the Analysis of Visual Spacetime

Advisor: Dr. Richard P. Wildes

M.Sc., Department of Computer Science, York University, 2001 – 2003.

Thesis: Vision Based Gesture Recognition within a Linguistics Framework

Advisors: Dr. John Tsotsos and Dr. Richard Wildes

Honours B.Sc., Department of Computer Science, University of Toronto, 2004 – 2010.

Minor, Department of Mathematics, University of Toronto, 2004 – 2010.

## Related Work Experience

Computer Science Graduate Program Director, Ryerson University, Toronto, ON, 2016 – current.

Associate Professor, Department of Computer Science, Ryerson University, Toronto, ON, 2015 – current.  
(granted early tenure)

Assistant Professor, Department of Computer Science, Ryerson University, Toronto, ON, 2012 – 2015.

Post-Doctoral Research Fellow, Professor Kostas Daniilidis (supervisor), University of Pennsylvania, GRASP Laboratory and Department of Computer and Information Science, Philadelphia, U.S.A., 2010 – 2012.

Technical Staff (summer internship), Sarnoff Corporation (a unit of SRI International), Princeton, New Jersey, U.S.A., 2005.

Teaching Assistant, marking and lab TA, Department of Computer Science, York University, Toronto, ON, 2001 – 2010.

Full-time Research Assistant, Department of Computer Science, York University, Toronto, ON, 2000-2001.

Full-time Research Assistant, Department of Computer Science, University of Toronto, Toronto, ON, 1999.

Teaching Assistant, ran weekly in-class tutorials, Introduction to Programming (CSC108), University of Toronto, ON, 1999.

## Funding, Awards and Recognition: Research

NVIDIA Hardware Donation, 1 Titan X (Pascal), retail value, \$2,000, 2017.

Recognized by European Conference on Computer Vision (ECCV) 2016 as an "outstanding reviewer".

Ryerson Faculty of Science Dean's Research Fund Research Tools and Instruments Grant, co-applicant with Dr. Miranskyy, \$15,000, 2016.

Ryerson Faculty of Science Dean's Travel Fund (IEEE Conference on Computer Vision and Pattern Recognition, Las Vegas, NV, USA), \$1,000, 2016.

Ryerson Faculty of Science Dean's Teaching Award, \$2,000, 2014-2015.

Mitacs Globalink Research Award – INRIA, \$9,356, 2015.

NVIDIA Hardware Donation, 1 NVIDIA K40, retail value \$5,000, 2015.

NSERC Engage, "Visual Analysis for Document Cluster", \$25,000 2014-2015.

NVIDIA Hardware Donation, 1 NVIDIA K40, retail value, \$5,000, 2014.

Recognized by IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2014 as an "outstanding reviewer"

NSERC Canadian Field Robotics Network (NCFRN) Distal Fellow, 2013-2015, \$5,000.

Ryerson Faculty of Science Dean's Travel Fund (IEEE International Conference on Computer Vision, Sydney, Australia), \$1,000, 2014.

Ryerson Faculty of Science Dean's Travel Fund (IEEE Conference on Computer Vision and Pattern Recognition, Portland, OR, USA), \$1,000, 2013.

NSERC Discovery Grant (Individual), \$100,000, 2013-2018.

Eshrat Arjomandi Award for Outstanding Ph.D. Dissertation, York University, 2010.

Canadian Image Processing and Pattern Recognition Society (CIPPRS) Doctoral Dissertation Honourable Mention 2011.

NSERC Industrial R&D Fellowship, \$40,000, 2011-2012. (preapproved)

NSERC Industrial R&D Fellowship, \$40,000, 2010-2011. (preapproved)

Precarn scholarship, \$7,500, 2007-2008.

Ontario Graduate Student (OGS) Scholarship, \$15,000, 2006-2007.

Ontario Graduate Student (OGS) Scholarship, \$15,000, 2005-2006.

Institute of Robotics and Intelligent Systems (IRIS) Student Fellowship, \$4,000, 2005.

Joseph Liu M.Sc. Thesis Award, Department of Computer Science, York University, 2003.

Natural Sciences and Engineering Research Council of Canada (NSERC) Post Graduate Scholarship (PGS B), \$21,000 (per year), 2003-2005.

Ontario Graduate Student (OGS) Scholarship, \$15,000, 2003-2004 (declined in favour of NSERC).

Institute of Robotics and Intelligent Systems (IRIS) Student Fellowship, \$8,000, 2002.

## Peer Reviewed Publications

### Journal Articles:

**Remark: PAMI is the premier journal in engineering and artificial intelligence with an impact factor of 5.694.**

1. Zhou, X., Zhu, M., Leonardos, S., Derpanis, K.G. and Daniilidis, MonoCap: Monocular Human Motion Capture using a CNN Coupled with a Geometric Prior, *IEEE Transactions on Pattern Analysis and Machine Intelligence*. (in review, impact factor of 5.694)
2. Kong, C., Ferworn, A., Coleshill, E., Tran, J. and Derpanis, K.G., What is a Hole? Discovering Access Holes in Disaster Rubble with Functional and Photometric Attributes, *Journal of Field Robotics (JFR)*, 2015. (accepted, impact factor of 2.152)
3. Derpanis, K.G., Sizintsev, M., Cannons, K., and Wildes, R.P., Action Spotting and Recognition Based on a Spatiotemporal Orientation Analysis, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, Vol. 35(3), 2013. (impact factor of 5.694)
4. Derpanis, K.G., Wildes, R.P., Spacetime Texture Representation and Recognition Based on a Spatiotemporal Orientation Analysis, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, Vol. 34(6), 2012. (impact factor of 5.694)
5. Derpanis, K.G., Wildes, R.P., The Structure of Multiplicative Motions in Natural Imagery, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 2(7), pp. 1310-1316, 2009. (impact factor of 5.694)
6. Derpanis, K.G., Wildes, R.P. and Tsotsos, J.K., Definition and Recovery of Kinematic Features for Recognition of American Sign Language Movements, *Journal Image and Vision Computing (IVC)*, Vol. 26(12), pp. 1650-1662, 2008. (impact factor of 1.496)
7. Herpers R., Derpanis, K., MacLean, W.J., Verghese, G., Jenkin, M., Milios, E., Jepson, A., Tsotsos, J.K., SAVI: An Actively Controlled Teleconferencing System. *Journal Image and Vision Computing (IVC)*, Vol. 19(11), pp. 793-804, 2001. (impact factor of 1.496)

### Conference Proceedings:

**ICCV, CVPR and ECCV are the top ranked conferences in computer vision, each with double-blind review processes. The typical acceptance rate is approximately 25%. ICRA is the premiere conference in robotics.**

1. Tesfaldet, M., Brubaker, M.A., and Derpanis, K.G., Two-Stream Convolutional Networks for Dynamic Texture Synthesis, *IEEE International Conference on Computer Vision and Pattern Recognition (CVPR)*, 2018. (in review)
2. Harley, A., Derpanis, K. and Kokkinos, I., Segmentation-Aware Convolutional Networks Using Local Attention Masks, *IEEE Conference on Computer Vision (ICCV)*, 2017.
3. Pavlakos, G., Zhou, X., and Derpanis, K.G. and Daniilidis, K., Coarse-to-Fine Volumetric Prediction for Single-Image 3D Human Pose, *IEEE International Conference on Computer Vision and Pattern Recognition (CVPR)*, 2017.
4. Pavlakos, G., Zhou, X., and Derpanis, K.G. and Daniilidis, K., Harvesting Multiple Views for Markerless 3D Human Pose Annotations, *IEEE International Conference on Computer Vision and Pattern Recognition (CVPR)*, 2017.
5. Pavlakos, G., Zhou, X., Chan, A., and Derpanis, K.G., and Daniilidis, K., 6-DoF Object Pose from Semantic Keypoints, *IEEE International Conference on Robotics and Automation (ICRA)*, 2017.

6. Yu, J.J., Harley, A.W. and Derpanis, K.G., Back to Basics: Unsupervised Learning of Optical Flow via Brightness Constancy and Motion Smoothness, European Conference on Computer Vision (ECCV) Workshop on Brave New Ideas for Motion Representations, 2016.
7. Zhou, X., Zhu, M., Leonardos, S., Derpanis, K.G. and Daniilidis, K., Sparseness Meets Deepness: 3D Human Pose Estimation from Monocular Video, IEEE International Conference on Computer Vision and Pattern Recognition (CVPR), 2016.
8. Harley, A., Derpanis, K. and Kokkinos, I., Learning Dense Convolutional Embeddings for Semantic Segmentation, International Conference on Learning Representations (ICLR) - Workshop track, 2016.
9. Harley, A., Ufkes, A., Derpanis, K.G., Evaluation of Deep Convolutional Nets for Document Image Classification and Retrieval, International Conference on Document Analysis and Recognition (ICDAR), 2015. (received "Best Student Paper" award)
10. Zhu, M., Derpanis, K.G., Yang, Y., Brahmabhatt, S., Zhang, M., Phillips, C. and Daniilidis, K., Single Image 3D Object Detection and Pose Estimation for Grasping, IEEE International Conference on Robotics and Automation (ICRA), 2014.
11. Zhang, W., Zhu, M. and Derpanis, K.G., From Actemes to Action: A Strongly-supervised Representation for Detailed Action Understanding, IEEE Conference on Computer Vision (ICCV), 2013.
12. Kong, C., Ferworn, A., Tran, J., Herman, S., Coleshill, E. and Derpanis, K.G., Toward the Automatic Detection of Access Holes in Disaster Rubble, IEEE Symposium on Safety Security and Rescue Robotics (SSRR), 2013.
13. Derpanis, K.G., Lecce, M., Daniilidis, K. and Wildes, R.P., Dynamic Scene Understanding: The Role of Orientation Features in Space and Time in Scene Classification, IEEE International Conference on Computer Vision and Pattern Recognition (CVPR), 2012.
14. Anati, R., Scaramuzza, D., Derpanis, K.G. and Daniilidis, K., Robot Localization using Soft Object Detection, IEEE International Conference on Robotics and Automation (ICRA), 2012.
15. Phillips, C.J., Derpanis, K.G., and Daniilidis, K., A Novel Stereoscopic Cue for Figure-Ground Segregation of Semi-Transparent Objects, IEEE Workshop on Challenges and Opportunities in Robot Perception, 2011.
16. Derpanis, K.G. and Wildes, R.P., Classification of Traffic Video Based on a Spatiotemporal Orientation Analysis. IEEE Workshop on Applications of Computer Vision (WACV), 2011.
17. Derpanis, K.G., Sizintsev, M., Cannons, K. and Wildes, R.P., Efficient Action Spotting based on a Spacetime Oriented Structure Representation, IEEE International Conference on Computer Vision and Pattern Recognition (CVPR), 2010.
18. Derpanis, K.G. and Wildes, R.P., Dynamic Texture Recognition based on Distributions of Spacetime Oriented Structure, IEEE International Conference on Computer Vision and Pattern Recognition (CVPR), 2010.
19. Derpanis, K.G. and Wildes, R.P., Detecting Spatiotemporal Structure Boundaries: Beyond Motion Discontinuities, Asian Conference on Computer Vision (ACCV), 2009.
20. Derpanis, K.G. and Wildes, R.P., Early Spatiotemporal Grouping with a Distributed Oriented Energy Representation, IEEE International Conference on Computer Vision and Pattern Recognition (CVPR), 2009.
21. Sizintsev\*, M., Derpanis\*, K.G., and Hogue, A., Histogram-Based Search: A Comparative Study, IEEE International Conference on Computer Vision and Pattern Recognition (CVPR), 2008. (\* equal contribution)
22. Derpanis, K.G., Leung E.T.H., and Sizintsev, M., Fast Scale-Space Feature Representations by Generalized Integral Images, IEEE International Conference on Image Processing (ICIP), Vol. 4, 521-524, 2007.

23. Derpanis, K.G. and Chang, P., Closed-form Linear Solution to Motion Estimation in Disparity Space, IEEE Intelligent Vehicle Symposium, pp. 268-275, 2006.
24. Mekuz, N., Derpanis, K.G. and Tsotsos, J.K., Adaptive Step Size Window Matching, International Conference on Pattern Recognition (ICPR), pp. 259-262, 2006.
25. Derpanis, K.G. and Gryn, J.M., Three-Dimensional nth Derivative Gaussian Separable Steerable Filters, IEEE International Conference on Image Processing (ICIP), Vol. 3, pp. 553-556, 2005.
26. Derpanis, K.G., Wildes, R.P. and Tsotsos, J.K., Hand Gesture Recognition within a Linguistics-Based Framework. European Conference on Computer Vision (ECCV), pp. 282-296, 2004.
27. Maclean, J., Herpers, R., Pantofaru, C., Wood, L., Derpanis, K., Topalovic, D. and Tsotsos, J.K., Fast Hand Gesture Recognition for Real-Time Teleconferencing Applications, IEEE International Workshop on Recognition, Analysis and Tracking of Faces and Gestures in Real-time Systems (RATFG), pp. 133-144, 2001.
28. Herpers, R., Derpanis, K., Topalovic, D., MacLean, J., Jepson, A. and Tsotsos, J., Active Visual Control by Stereo Active Vision Interface SAVI, Workshop Dynamische Perzeption, pp. 81-86., 2000.
29. Herpers, R., Verghese, G., Derpanis, K., McCready, R., Maclean, W.J., Levin, A., Topalovic, D., Wood, L., Jepson, A. and Tsotsos, J.K., Detection and Tracking of Faces in Real Environments, International Workshop on Recognition, Analysis and Tracking of Faces and Gestures in Real-Time Systems (RATFG), pp. 96-104, 1999.
30. Herpers, R., Verghese, G., Chang, L., Darcourt, K., Derpanis, K., Kaufman, J., Jenkin, M., Milios, E., Jepson, A. and Tsotsos, J.K., An Active Stereo Vision System for Recognition of Faces and Related Hand Gestures, Second International Conference on Audio and Video-based Biometric Person Authentication (AVBPA), pp. 211-216, 1999.

## Selected Presentations

Computer Vision Goes Back to the Future, Western/SHARCNET Workshop on Deep Learning and OpenPOWER, October 2016 (invited talk)

Building Seeing Machines, Days of Science Symposium, Ryerson, May 2015. (invited lecture)

From 3D Models to Images: Object Detection and Pose Estimation in Cluttered Scenes, McGill, NSERC Canadian Field Robotics Network (NCFRN) Annual Meeting, May 2014. (invited talk).

On the Role of Spacetime Orientation for Representing and Analyzing Dynamic Visual Imagery with Applications, University of Pennsylvania, GRASP seminar, December 2009. (invited talk).

Automated Gesture Recognition within a Linguistics-Based Framework, University of Toronto, Department of Computer Science, April 2004. (invited talk)

Exploiting a Linguistics Decomposition for Gesture Recognition, IEEE Workshop on Applications in Computer Vision, 2002. (invited demonstration)

## Supervision

2017 – 2018, Jason Yu, Undergraduate Thesis Supervisor, Ryerson University

2017 – 2018, Andrei Betlen, Undergraduate Thesis Supervisor, Ryerson University

2016 – current, Matthew Tesfaldet, M.Sc. Co-supervisor, York University

2015 – current, Domenic Curro, M.Sc. Supervisor, Ryerson

2015 – current, Hasan Almawi, M.Sc. Supervisor, Ryerson

2014 – 2016, Adam Harley, M.Sc. Supervisor, Ryerson, now a PhD student at the Robotics Institute, Carnegie Mellon University (CMU)

received Ryerson University's Governor General Gold Medal Award

2014 – 2015, Christopher Kong, M.Sc. Supervisor with Dr. A. Ferworn, Ryerson

Thesis nominated for Ryerson University's Governor General Gold Medal Award

## Teaching

2013 – current, instructor/coordinator, Introduction to Computer Vision (undergraduate and graduate levels), Ryerson University, [scs.ryerson.ca/~kosta/CPS843-W2017/index.html](http://scs.ryerson.ca/~kosta/CPS843-W2017/index.html)

2013 – current, instructor/coordinator, Computer Science 1 (undergraduate), Ryerson University, [scs.ryerson.ca/~kosta/CPS109-F2017/CPS109-outline.html](http://scs.ryerson.ca/~kosta/CPS109-F2017/CPS109-outline.html)

2013 – 2016, instructor, Computer Science 1 (undergraduate), Ryerson University, [scs.ryerson.ca/~kosta/CPS125-W2016/CPS125-outline.html](http://scs.ryerson.ca/~kosta/CPS125-W2016/CPS125-outline.html)

## Academic and External Service

2014, Reviewer, Mitacs Accelerate Internship Program (two times)

2014 – current, Reviewer, IEEE Transactions on Image Processing (TIP)

2014 – current, Reviewer, Conference on Computer and Robot Vision (CRV)

2013 – current, Reviewer, IEEE Conference on Computer Vision and Pattern Recognition (CVPR)

2013 – current, Reviewer, European Conference on Computer Vision (ECCV)

2013 – current, Reviewer, IEEE International Conference on Robotics and Automation (ICRA)

2013 – current, Reviewer, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

2012, Reviewer, IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)

2010 – current, Reviewer, International Journal of Computer Vision (IJCV)

2004 – current, Reviewer, Image and Vision Computing (IVC)

2003 – current, Reviewer, Computer Vision and Image Understanding (CVIU)

2004 – current, Reviewer, IEEE International Conference on Computer Vision (ICCV)

2016 – current, Reviewer, Neural Processing and Information Systems (NIPS)

2018, Reviewer, International Conference on Learning Representations (ICLR)