Kostas Daniilidis
Ruth Yalom Stone Professor
Computer and Information Science Department
University of Pennsylvania

http://www.cis.upenn.edu/~kostas
3330 Walnut Street, Levine Hall
Philadelphia, PA 19104
kostas@cis.upenn.edu, (215) 898 8549

Education

1992 PhD in Computer Science, University of Karlsruhe, Advisor: Hans-Hellmut Nagel
1986 Diploma (Master's) in Electrical Engineering, National Technical University of Athens.

Academic Positions held

2026 - **Research Director**, Athena Research Center, Athens, Greece
2009 - **Professor**, Computer and Information Science, University of Pennsylvania
2015 - 2017 **Director of Online Programs**, Penn Engineering
2012 - 2016 **Associate Dean for Graduate Education**, Penn Engineering
2008 - 2013 **Director** of the GRASP Laboratory
2003 - 2009 **Associate Professor**, Computer and Information Science, University of Pennsylvania.
1998 - 2003 **Assistant Professor**, Computer and Information Science, University of Pennsylvania.
1993 - 1997 **Assistant Professor** (non-tenure-track), Computer Science Institute, Kiel University.
1989 - 1992 **Graduate Research/Teaching Assistant**, Computer Science, University of Karlsruhe.

Honors

2025 Provost's Award for Distinguished PhD Teaching and Mentoring
2019 Best Paper Finalist CVPR 2019
2018 Best Student Paper Finalist RSS 2018
2018 Finalist KUKA Innovation Award
2017 Best Conference Paper IEEE ICRA 2017
2016 Ruth Yalon Stone Chair
2015 Best Paper Finalist IEEE CASE 2015
2012 IEEE Fellow
2001 Ford Motor Company Award for Best Faculty Advising in Penn Engineering.

Research Grants as Penn Lead Principal Investigator with $/yr

Period	Sponsor	Title	Penn's budget
2025 - 2027	Apple	Visual-tactile Fields	300K/yr
2021 - 2027	SONY	Event-based Depth	200K/yr
2023 - 2024	IARPA	Microelectronics for AI ME4AI, sub to Purdue	166K/yr
2022 - 2025	ONR	Uncertainty-based Active Self-Learning for Perception	500K/yr
2022 - 2026	NSF	RI: Medium: Learning to Map and Navigate with Vision and Language	300K/yr
2022 - 2025	NSF	Collaborative Research: Visual Tactile Neural Fields for Active Digital Twin Generation	90K/yr
2018 - 2021	Honda	Curious Minded Machines	900K/yr
2018 - 2023	SRC-DARPA	C-BRIC: Brain Inspired Computing;	200K/yr
2017 - 2021	ONR	Active Distributed Perception PI	1.1M/4yr
2017 - 2021	NSF	RI: Medium: Collaborative Research: Closed Loop Perceptual Planning for Dynamic Locomotion	330K /3yr
2019	Google AR/VR	3D Human Pose and Shape for AR/VR	150K
2019	Amazon	Event-based Vision	75K
2016 - 2019	NSF	MRI:Development of an Observatory for Quantitative Analysis of Collective Behavior in Animals PI	339K/2yr
2010 - 2019	ARL	Robotics Collaborative Technology Alliance PI	≈$1M/yr
2015 - 2016	GSK	Grasping of transparent objects	$75K
2014 - 2019	NSF	I/UCRC Phase I: Robots and Sensors for the Human Well-being	$325K total
2013 - 2014	ARO	STTR: Bio-Inspired Visual Navigation: From Landmarks via Bearing to Controls, Phase I and II, subcontract to IAI	$ 40K
2013 - 2015	NSF	NRI: Small: Collaborative Research: Active Sensing for Robotic Cameramen	$ 450K
2012 - 2013	DARPA	Team TROOPER, LM-UPenn-RPI participation at the Robotics Challenge	∼$600K
2012 - 2013	NSF	I-Corps: BlindNav: Indoor Navigation for the Visually Impaired	$ 50K
2011 - 2012	ARO	R-MASTIF (Robotic Mobile Autonomous System for Threat Interrogation and Object Fetch)	$ 200K
2010 - 2015	NSF	IGERT: Complex Scene Perception; PI	$2.4M/5yrs
2010 - 2014	NSF	CDI-Type II: Collaborative Research: Perception of Scene Layout by Machines and Visually Impaired Users; single PI from Penn	$325K/4yrs
2009 - 2013	NSF	CDI-Type II: Cyber enhancement of spatial cognition for the visually impaired; single PI from Penn (lead);	$112,500/yr

2009 - 2010	DARPA	STTR: Labeling buildings by video activities; single PI, sub to A. Hoogs (Kitware)	$40,000/yr
2007 - 2009	ARL	Navigation based on a snapshot graph; single PI	$150,000/yr
2007 - 2010	NSF	Bio-inspired visual navigation; single PI	$75,000/yr
2004 - 2007	NSF	SEIII: Computing and Retrieving 3D-Archaeological Structures from Subsurface Surveying, PI with J. Shi and G. Biros; F. Limp (U. of Arkansas)	$350,000/yr
2003-2008	NSF	ITR: Multirobot Emergency Response; Penn PI with G. Pappas; N. Papanikolopoulos (U. Minnesota, lead), J. Burdick (Caltech)	$110,000/yr
2001-2004	NSF	ITR:Real-time long distance terascale computation for full bandwidth tele-immersion, single Penn PI with H. Fuchs and G. Waelch (lead, UNC)	$310,000/yr
2001-2002	DARPA	3D-Tele-immersion for the Next Generation Internet, single Penn PI with H. Fuchs (lead, UNC).	$146,000/yr
2001-2002	NSF	Advanced Surgical Training with High-Fidelity Tele-immersion, single Penn PI with H. Fuchs (lead, UNC)	$430,988/yr
2000-2003	NSF	Omnidirectional Vision, single PI	$90,000 /yr
2000-2001	Penn RF	Adding the Sense of Touch to Tele-presence, PI	$15,000 /yr
1999-2000	ANS Inc.	Scene acquisition for teleimmersion, PI	$200,000 /yr
1999-2000	Penn RF	Augmented Reality Goes Outdoors, PI	$15,000 /yr

Grants where I am Co-principal investigator:

Period	Sponsor	Title	Penn's budget
2024 - 2027	DSO	Neurfly	PI: Chaudhari
2023 - 2025	DARPA	TRIAGE	PI:Eaton
2020 - 2023	NSF	HDR TRIPODS: FINPenn: Center for the Foundations of Information Processing at the University of Pennsylvania	PI Ribeiro
2020 - 2024	NSF	CPS: Medium: Robust Learning for Perception-Based Autonomous Systems	PI Matni
2020 - 2025	ARO	MURI: Robust Concept Learning and Lifelong Adaptation Against Adversarial Attacks	PI Lee
2018 - 2023	ARL	DCIST;	PI Kumar
2015 - 2018	NSF	Neural Bases of Song Preference and Reproductive Behavior in a Female Songbird co-PI with Schmidt	Pi Schmidt
2013 - 2017	ONR	Planning and Perception for Deck Operations	PI Topcu
2012 - 2013	KLA-Tencor	Accurate mapping of construction sites in progress	PI Taylor
2010 - 2011	DARPA	Autonomous Robotic Manipulation	PI Kumar
2008 - 2013	ARL	MAST CTA Autonomous multifunctional mobile microsystems	Pi Kumar
2007 - 2008	NSF	I/UCRC Safety, Security and Rescue research Center	PI Kumar
2007-2008	DARPA	Object Recognition via Brain-Inspired Technology	PI Taskar
2004 - 2005	NSF	RR:MACNet: Mobile Ad-hoc Camera Networks	Pi Shi
2002-2005	ARO	ACCLIMATE: Adaptive Coordinated ControL of Intelligent Multi-Agent Teams	Pi Kumar
1998-2000	ARO	Algorithmics of motion	Pi Kumar
1998-1999	DARPA	Omnidirectional Vision for Surveillance, Tracking, and Navigation	PI Kumar

Colloquia and Seminars at Institutions

1. HERON Seminar, Active Perception with Symmetry and Guidance, July 2026
2. WPI Robotics Seminar, Beyond Scaling: Efficient Perception Through Action and Symmetry, February 2026
3. Georgia Tech Robotics Seminar, Beyond Scaling: Efficient Perception Through Action and Symmetry, January 2026
4. George Mason University CS Colloquium, Beyond Scaling: Efficient Perception Through Action and Symmetry, October 2025
5. Lincoln Labs GraphEx Symposium, Symmetry in 3D Perception, May 2025
6. NUS, Active Exploration and Symmetry in 3D Perception, May 2025
7. University of Michigan, Robotics Colloquium, Efficient 3D Perception, February 2025
8. Chalmers University AI Seminar, November 2024
9. Oregon State AI Colloquium Equivariant Deep Learning, April 2024
10. Lehigh University Robotics Colloquium Equivariant visual Learning December 2023
11. University of Toronto Robotics Seminar: From Semantic SLAM to Semantic Navigation, October 2022
12. Booz Allen Hamilton Colloquium University of Maryland: Data Efficiency through Symmetry and Event-based Processing in Robot Perception, September 2022
13. UPenn ASSET Seminar: Equivariance in Deep Learning, September 2022
14. Archimedes Institute: Symmetry in Deep Learning, July 2022
15. Curious Minded Machines, Honda Research, July 2020
16. Event-based Vision, Samsung Strategy and Innovation Center, September 2020
17. Learning geometry-aware representations for 3D inference, UW Robotics Colloquium, November 2019.
18. Geometry-aware Representations for 3D Pose and Shape, MIT, 2019
19. Geometric Deep Learning, Brown University, 2018
20. Geometry Aware Learnt Representations, Oxford University, 2018
21. UTRC, Event-based vision, September 2018
22. SUNY Stonybrook CS Seminar, Learning 3D Geometry, March 2017
23. Niarhos Foundation Seminar Series, July 2017
24. Huawei Workshop: 3D human pose from single image

25. 3D Object and Human Pose, Linkoping University, May 2016.

26. 3D Object Recognition, Hong Kong UST Colloquium, June 2014.

27. 3D Object Shape and Pose from Single Images, UC Berkeley Vision Seminar, 2013

28. Object based localization, United Technologies Research Center, September 25, 2012.

29. 3D Object Recognition in Images and Videos, Engineering Colloquium, Lehigh University, October 17, 2011

30. 3D Object Recognition in Images and Videos, Engineering Colloquium, Harvard University, October 15, 2010

31. Shape-based recognition in point clouds, video, and single pictures, Georgia Tech RIM Colloquium, April 4, 2010.

32. Shape-based recognition in point clouds, video, and single pictures, Departmental Colloquium, Temple University, February 26, 2010.

33. 3D object recognition, CS Seminar, University of Illinois at Chicago, November 2, 2009.

34. Image Matching: Appearance, Geometry, Shape, Computer Vision Seminar, Columbia University, January 13, 2009.

35. Image Matching: Harmonic Analysis and Graph Spectral Techniques, RPI Computer Science Seminar, September 28, 2007.

36. Image Matching: Harmonic Analysis and Graph Spectral Techniques, UCLA Computer Science Colloquium, April 23, 2007.

37. Image Matching, Drexel Math Colloquium, March 20, 2007.

38. Image Matching Beyond Correspondence, Johns Hopkins Center for Imaging, February 13, 2007.

39. Visual localization and registration without matching, Institute of Computer Science, FORTH, Heraclion, Crete, May 11, 2006.

40. 3D beyond graphics, Athens Institute of Technology, April 28, 2006.

41. Localization as a Filtering Problem, University of Delaware, November 29, 2004.

42. Geometry and Signal Analysis Beyond the Projective Plane, Computer Science Department, Aristotle University of Thessaloniki, September 9, 2003.

43. Geometry and Signal Analysis Beyond the Projective Plane, Center for Automation Research, University of Maryland at College Park, February 14, 2003.

44. Signal Analysis and Geometry of Immersive Sensing, Computer Science Colloquium, Johns Hopkins University, October 24, 2002.

45. Signal Analysis and Geometry of Immersive Sensing, AI-Robotics-Vision Seminar, UC Berkeley, September 26, 2002.

46. The Geometry of Omnidirectional Views, ECE Graduate Colloquium, University of Illinois at Urbana-Champaign, September 5, 2002.

47. Multiple Omnidirectional Views, University of Washington, Graphics Seminar, February 10, 2002.

48. The Geometry of Omnidirectional Views, Columbia University, November 28, 2001.

49. Catadioptric Mappings, Stevens Institute of Technology, November 7, 2001.

50. Image Processing in the Catadioptric Plane, Third Workshop on Omnidirectional Vision, Copenhagen, June 3, 2001.

51. Omnidirectional Vision and Catadioptric Mappings, Vision Interface Conference, Ottawa, June 7, 2001.

52. Omnidirectional Vision: Theory and Algorithms, International Conference for Pattern Recognition, Barcelona, Spain, Sep. 1, 2000.

53. Omnidirectional Vision and Tele-presence, *Department of Computer Science, University of Erlangen*, October 6, 2000.

54. Omnidirectional Vision for Immersive Environments, *School of Computing*, University of Utah, July 6, 2000.

55. Omnidirectional Vision for Immersive Environments, *Center for Automation Research Seminar*, University of Maryland at College Park, May 19, 2000.

56. View-independent Scene Acquisition for Tele-immersion, *NTII-Day, Graphics Laboratory, Computer Science Department, University of North Carolina*, May 9, 2000.

57. Omnidirectional Vision for Immersive Environments, *CMU Robotics Institute Seminar*, April 21, 2000.

58. Omnidirectional Vision for Immersive Environments, *MIT AI Lab Colloquium*, April 20, 2000.

59. Catadioptric Geometry, Vision Seminar, EECS Department UC Berkeley, Aug. 16, 1999

60. Autocalibration and 3D-Reconstruction for Augmented Reality and Teleimmersion, IEEE Signal Processing Society, Philadelphia Section, June 21, 1999

61. Autocalibration and 3D-Reconstruction for Augmented Reality and Teleimmersion, Joint Heidelberg-Mannheim Vision Seminar, University of Mannheim, June 1, 1999

62. Catadioptric Visual Systems, Informatics-Colloquium, Kiel University, May 28, 1999

63. Minimally Calibrated Reconstruction for Augmented Reality, Vision Lunch Series, Computer Science Department, Yale University, Jan. 22, 1999.

64. Minimally Calibrated Reconstruction for Teleimmersion and Augmented Reality, Siemens Research Corporation, Sep. 03, 1998.

65. Dual Quaternions for Hand-Eye Calibration, Robotics Group Seminar, Computer Science Department, Stanford University, Aug. 19, 1998

66. Efficient Represenations for Calibration Tasks, Robotics Seminar, EECS Department UC Berkeley, Aug. 17, 1998.

67. We move, therefore we see, Neuroinformatik-Kolloquium, Universität Ulm, Jan. 8, 1998.

68. Active visual motion analysis, Colloquium of the Computer Science Institue, FORTH, Heraclion, Crete, Jul. 22, 1997

69. Ortsvariantes aktives Bewegungssehen, Daimler-Benz, Forschungszentrum Ulm, Apr. 22, 1997.

70. We move, therefore we see, Colloquium, Department of Computer and Information Science, University of Pennsylvania, Mar. 4, 1997

71. 3D-motion estimation with active and space-variant systems, CVAP and Center for Autonomous Systems Seminars, KTH, Stockholm, Nov. 19, 1996

72. Advantages of active and space-variant sensing with respect to motion estimation, Workshop for Alternative Camera Technology ALCATECH96, Sjaellands Odde, Denmark, July 25, 1996

73. A new solution for the hand-eye calibration problem, INRIA Rocquencourt, June 28, 1996.

74. Neuere Entwicklungen in der Berechnung der 3D-Bewegung aus monokularen Bildfolgen, Fachbereich Mathematik und Informatik der Friedrich-Schiller-Universität Jena, May 15, 1996

75. Berechnung des optischen Flusses und der 3D-Bewegung in der komplex-logarithmischen Ebene, Freitagskolloquium, Max-Planck Instituts für Biologische Kybernetik, June 9, 1995.

76. Motion computations on the log-polar plane, *Computer Science Colloquium*, Computer and Information Science Department, University of Pennsylvania, Oct. 25, 1994.

77. Motion computations on the log-polar plane, *Computer Vision Laboratory Seminar*, University of Maryland at College Park, Oct. 21, 1994.

78. On error sensitivity and ambiguity of motion estimation from monocular image sequences, *Colloquium of the Computer Science Department, Technical University of Berlin*, Berlin, Germany, Jan. 19, 1993.

79. Three-dimensional motion estimation from monocular image sequences,
Colloquium of the Research Institute for Applied Knowledge Based Systems (FAW), Ulm, Germany, Dec. 17, 1992.

Invited Talks at Conferences and Workshops

1. NSF FRR PI Meeting, Inductive Biases in Manipulation, October 2025

2. CVPR 2026 Workshop on Inductive Biases in Perception, Trajectory Diffusion on Riemannian Manifolds, June 2025

3. ICRA@40 Conference Distinguished Speaker, Efficient Robot Perception, October 2024

4. NeuReps Online Series, Symmetry and Geometry in Representations, Equivariant Inertial Odometry, December 2024

5. European Summer School on AI 2024, Plenary Talk, Efficient Perception through Symmetry and Neuromorphic Sensing, July 2024
6. CPAL 2024 Invited Speaker at the inaugural Conference on Parsimonious Learning
7. CVPR 2023 Bird Tracking, CV4Animals CVPR Workshop
8. ECCV 2022 Visual Object-oriented Learning meets Interaction (VOLI): Discovery, Representations, and Applications
9. ICRA 2022 Workshop on Robotic Perception and Mapping Emerging Techniques: Beyond SLAM: Semantic Navigation
10. 3DGV Seminar: 3D Humans and Animals, September, 2021
11. RSS Robotics: Science and Systems Workshop Visual Learning and Reasoning for Robotic Manipulation, The Curious Explorer, 2020.
12. NSF Robot Learning Workshop, Lehigh University 2019
13. Plenary at the Int. Conf. on Computer Vision Systems 2019
14. ELLIS Geometric Machine Learning Workshop 2019
15. Scenes from Video Workshop 2019
16. IPAM Workshop on the Geometry of Big Data, 2019
17. Geometry Meets Deep Learning Workshop, ECCV 2018
18. LAIR Workshop, RSS 2018
19. Bridges to 3D Workshop, CVPR 2018
20. 3DHUMAN, CVPR 2018
21. Aerial Symposium, 2018.
22. Marconi Symposium, Oct 2, Murray Hill, 2017.
23. SIBGRAPI Conference on Graphics and Pattern Analysis, October 2017
24. Scenes from Video Workshop, Nov 1, 2017, Lake Garda
25. 3DV tutorial: 3D Shape and Pose from Single Image, Stanford U., Oct. 2016
26. 3D Shape and Pose of Object Categories, ICCV Workshop on 3D Representation and Recognition, Dec 2015
27. Seeing Glass, ICCV Workshop on 6D Pose, Dec 2015
28. Semantic Consensus, ARL Workshop on Distributed and Collaborative Intelligence, Dec 2015
29. 3D Object Recognition, Penn-Chinese Academy of Sciences Summer School, June 2015
30. 3D Shape and Pose of Object Categories, Robot Vision Conference, Nova Scotia, June 2015.

31. Active Vision Revisited, Workshop on Active Perception, ICRA 2015

32. Active Object Detection, Workshop on Active Learning, ICRA 2014

33. From appearance to geometry: Place and 3D object recognition, Workshop in honor of Professor Sommer's retirement, June 2012.

34. From appearance to geometry: Place and 3D object recognition, Workshop in honor of Professor Eklundh's 70th birthday, July 2009.

35. Pure vision based SLAM in large urban environments, ARL Vehicle Directorate Review Meeting, June 3, 2008.

36. Pure vision based SLAM in large urban environments, ARL/NSF Workshop on Future directions for visual navigation, Pasadena, May 19, 2008.

37. Pure visual metric and topological mapping, ARL CTA Colloquium, March 9, 2008

38. Visual Navigatioon for Humanoids, Invited presentation at the Workshop for Active Vision for Humanoids, November 29, 2007.

39. Visual registration without matching, ERCIM Spring Meetings, Memorial session for Stelios Orphanoudakis, Budapest, May 30, 2006.

40. Structure from motion without correspondence, Computer Vision and Pattern Recognition Colloquium, Technical University of Prague, April 6, 2006.

41. Localization without correspondence, Post-AC meeting, Courant Institute, NYU, Feb 27, 2006.

42. Localization as a Filtering Problem, York Symposium on Computational Vision, York University, June 18, 2005.

43. Geometry and Signal Analysis Beyond the Projective Plane, Colloquium, Technical University of Prague, January 14, 2004.

44. Navigation without correspondence, IROS Workshop on Visual Servoing, Sept. 30, 2004.

45. Visual navigation based on filtering instead of correspondences,ICRA 2004 - Workshop, Multirobot Search and Rescue: Current Challenges and Future Directions, April 27, 2004.

46. Immersive Sensing, Visualization and Visual Modeling Workshop VMV 2002, Erlangen, November 22, 2002.

47. Structure from Motion from Omnidirectional Views, ICAR-Workshop on Omnidirectional Vision, Budapest, August 22, 2001.

48. Catadioptric mappings, *Workshop on shape and surface geometry, American Mathematical Society Meeting*, April 28, 2001.

49. A Unifying Theory of Imaging Systems, *Workshop on Theoretical Foundations of Computer Vision*, Schloß Dagstuhl, Mar. 18, 2000.

50. Ego-motion perception and disortion of perceptual space, Symposium Gehirn und Gestalt, Institute for Advanced Studies, Delmenhorst, June 3, 1999.

51. Attentive visual motion processing, *Workshop on Preattentive and Attentive Visual Processing, PAP*, MPI fuer biophysikalische Chemie, Göttingen, Oct. 5, 1994.

52. Issues on attentive visual motion processing, *Workshop on Theoretical Foundations of Computer Vision*, Schloss Dahstuhl, Mar. 13, 1994.

53. Modeling 3D-transformations with dual quaternions: The case of hand-eye calibration, *Workshop on Theoretical Foundations of Computer Vision*, Schloß Dagstuhl, Mar. 18, 1996.

54. Ortsvariantes Bewegungssehen, Workshop *Kognitive Robotik*, Zentrum für Kognitionswissenschaften, Universität Bremen, Mar. 2, 1995.

55. On the relation between instability in motion estimation and critical surfaces,
ESPRIT BRA Insight Meeting, Nice, France, June 19-21, 1991.

56. On error sensitivity of motion estimation from two views,
The 1989 Stockholm Workshop on Computational Vision, Stockholm, Sweden, Aug. 7-10, 1989.

Professional Activities, only leadership positions are shown

2025	CVPR Workshop on Event-Based Vision
2025	CVPR Workshop Equivariance in Computer Vision
2024	IROS Workshop Symmetry in Dynamical Systems and Robotics
2024	CVPR Workshop Equivariance in Computer Vision
2023	CVPR Workshop on Event-Based Cameras
2020	One Day Equivariance Workshop with Edgar Dobriban (Wharton)
2016-2018	ECCV , ICCV, Workshop Geometry meets Deep Learning
2015	Workshop and Tutorials Chair ICCV 2015
2010	**Program Cochair of ECCV 2010**
2008	Short Courses Organizer for IEEE CVPR 2007
2003 - 2007	**Associate Editor of the IEEE Transactions on Pattern Analysis and Machine Intelligence**
2006	with Marc Pollefeys, Conference Chair of 3rd International Symposium on 3D Data Processing, Visualization, and Transmission (now 3DV)
2000 - 2006	Co-Chair of the Computer and Robot Vision TC of the IEEE Robotics and Automation Society
2000	Chair of the First IEEE Workshop on Omnidirectional Vision

Teaching

Undergraduate Courses at the University of Pennsylvania

CIS 107/VLST 209, Visual Culture Through the Eye of the Computer Spring 2021, Fall 2022, Fall 2025

CIS 121 Introduction to Programming Languages, Spring 2007, Spring 2008, Fall 2008, Fall 2009, Fall 2010, Fall 2011, Fall 2012, Fall 2014, Fall 2019, Fall 2020.

CSE 390 Robotics, Fall 2004, Fall 2003, Fall 2002, Spring 2002, Fall 2015 and 2016.

CSE 240 Introduction to Computer Architecture, Fall 2000, Fall 1999, Fall 1998.

Graduate Courses at the University of Pennsylvania

CIS 7000 with Jean Gallier: Advanced Topics in Geometric Deep Learning

CIS 580 Machine Perception, all 2006, Fall 2007, Spring 2009, Spring 2010, Spring 2011, Spring 2012, Spring 2013, Fall 2013, Spring 2018, Spring 2019, Spring 2020, Spring 2021, Spring 2022,Spring 2023, Fall 2023, Fall 2024, Fall 2025

MEAM 620 Advanced Robotics, Spring 2013, 2014, 2015, 2016, 2017, 2018.

EMTM 695 Robotics and Automation, Fall 2007, Fall 2008, Fall 2009, Winter 2010, Winter 2011, Winter 2012.

CIS 700 Special Topics in Machine Perception (with J. Gallier), Spring 2004.

CIS 680 Advanced Topics in Machine Perception, Spring 2000, Spring 1999, Spring 2003.

CIS 700 Special Topics in Machine Perception, Spring 2001.

PhD Dissertation supervision

Current PhD students

1. Wentinn Liao (2026-)
2. Yunzhou Song (2025-)
3. Boshu Lei (2025-)
4. Matthew Leonard (2024-)
5. Ioannis Asmanis (2022-)
6. Agelos Kratimenos (2021-)
7. Anthony Bisulco (2021-), co-advisor
8. Katrina Ashton (2020-)
9. Evangelos Chatzipantazis (2018-)

Graduated PhD students, thesis' titles, and their current positions

1. Stefanos Pertigiozoglou (Apple)
2. Yufu Wang (Epic Games)
3. Ziyun Wang **(Johns Hopkins University)**
4. Wen Jiang (Waymo)
5. Yinshuang Xu (Apple)
6. Jiahui Lei (Berkeley Postdoc)
7. Kenneth Chaney, (Associate Director UPenn PARCC)
8. Kendall Queen (Asylum Robotics)
9. Bernadette Bucher **(University of Michigan)**
10. Karl Schmeckpeper (Boston Dynamics AI Institute)
11. Nikos Kolotouros (Google Research)
12. Oleh Rybkin (Postdoc Berkeley)
13. Carlos Esteves (Google Research)
14. Wenxin Liu (LFI)
15. Stephen Phillips (Boston Dynamics AI Institute)
16. Alex Zhu (Waymo)
17. George Pavlakos **(University of Texas, Austin)**

18. Christine Allen-Blanchette **(Princeton University)**
19. Monroe Kennedy III, co-advised with Vijay Kumar **(Stanford University)**
20. Mabel Zhang (OSRF)
21. Spyros Leonardos (Voleon)
22. Jason Owens (Aurora)
23. Nikolay Atanasov, co-advised with George Pappas **(UC San Diego)**
24. Drew Jaegle (DeepMind)
25. Cody Phillips (Meridian)
26. Roy Anati (Google)
27. Menglong Zhu (DJI)
28. Mayank Bansal (Apple)
29. Alexander Patterson (SightLogix)
30. Oleg Naroditsky (Apple)
31. Alexander Toshev (Apple)
32. Ankita Kumar (Oracle)
33. Nima Moshtagh, co-advised with Jadbabaie (JHU/APL)
34. Ameesh Makadia (Google Research)
35. Volkan Isler, co-advised with Kannan and Khanna, **(University of Minnesota)**
36. Christopher Geyer (Berkshire Gray)
37. Adnan Ansar (NASA/JPL)
38. Weichuan Yu, co-advised with Gerald Sommer **(Hong Kong UST)**

Postdoctoral research supervision

1. Diego Patino (2020-2023, UT Arlington)
2. Georgios Georgakis (2020-2023, NASA)
3. Marc Badger (2019-2022, Aescape)
4. Bernd Pfrommer (2016-2018)
5. Xiaowei Zhou (2014 - 2017), Zhejiang University
6. Roberto Tron (2013-2015), Boston University
7. Luis Puig (2013 - 2015), Geomagical.

8. Konstantinos Derpanis (2010-2012), York University.
9. Davide Scaramuzza (2011-2012), University of Zurich.
10. Jean-Philippe Tardif (2007-2008), Researcher at Carnegie Mellon University.
11. Philippos Mordohai, Stevens Institute of Technology.
12. Irene Cheng (2006-2008), University of Alberta.
13. Gian-Luca Mariottini (2007), Draper Labs.
14. Rodrigo Carceroni (2005-2006), Google, Mountain View.
15. Thomas Buelow (2000-2002), Philips Research.
16. Xenophon Zampoulis (2002-2003), Senior Researcher at FORTH, Greece.
17. Joao Pedro Barreto (2003), University of Coimbra, Portugal.
18. Jane Mulligan (1998-2001), University of Colorado at Boulder.

Service

- 2026 Faculty Personnel Committee
- 2025 GRASP Director Search Committee
- 2025 CIS Recruiting Committee
- 2024 Head of Faculty Recruiting Committee
- 2023 PhD Milestones Committee
- 2018-2024 FCAA Committee
- 2015 - 2017 Director of Online Programs
- 2012 - 2016 Associate Dean for Doctoral Education, Penn Engineering,
- 2008-2013 GRASP Laboratory Director
- 2008-2011 Director of the Robotics Masters Program
- 2008-2010 Engineering Honors Committee
- 2007 Department Chair Search Committee
- 2007-2008 CIS Graduate Admission Chair
- 2001 SEAS Committee on Academic Performance
- 1997 Service at the Greek Army (Mechanized Infantry).

Patents

- US Patent 6,982,743: K. Daniilidis, E. Angelopoulou, V. Kumar, Multispectral Omnidirectional Sensor.
- US Patent 20,150,325,003: METHODS, SYSTEMS, AND COMPUTER READABLE MEDIA FOR VISUAL ODOMETRY USING RIGID STRUCTURES IDENTIFIED BY ANTIPODAL TRANSFORM; Cleveland, Daniilidis
- US Patent US-10733661-B1: Automatic mapping of store layout using soft object recognition; Walgreen Corp, and University of Pennsylvania, Bergstrom, Cleveland, Thakur, Dames, Philips, Kientz, Daniilidis, Kumar
- US Patent 20230059839: QUOTIDIAN SCENE RECONSTRUCTION ENGINE; Quidient LLC, Ackerson, Meagher, Leffingwell, Daniilidis
- US Patent 20230136306: SYSTEMS AND METHODS FOR REAL-TIME STATE ESTIMATION OF FAST-MOVING OBJECTS, Samsung and the Trustee of University of Pennsylvania, Wang et al.
- US Patent 11288818-B2 Methods, systems, and computer readable media for estimation of optical flow, depth, and egomotion using neural network trained using event-based learning; Daniilidis and Zhu
- US Patent 11138742-B2: Event-based feature tracking; Daniilidis, Zhu, Atanasov
- US Patent 11187536-B2: Probabilistic data association for simultaneous localization and mapping; Daniilidis, Pappas, Bowman, Atanasov
- US Patent US-12299899-B2: Systems and methods for real-time state estimation of fast-moving objects; Wang, Cladera, Bisulco, Lee, Taylor, Daniilidis, Hsieh, Isler

Startups 2012 - 2018 Co-Founder and Scientific Advisor of COSY Inc.

References

[1] Boshu Lei, Wen Jiang, and Kostas Daniilidis. ActiveGrasp: Information-Guided Active Grasping with Calibrated Energy-based Model. In *Computer Vision Pattern Recognition*, June 2026.

[2] Richeek Das, Kostas Daniilidis, and Pratik Chaudhari. Fast Feature Field (F^3): A Predictive Representation of Events. *Science Robotics*, 2026.

[3] Stefanos Pertigkiozoglou, Mircea Petrache, Shubhendu Trivedi, and Kostas Daniilidis. Recurrent Equivariant Constraint Modulation: Learning Per-Layer Symmetry Relaxation from Data. In *International Conference on Machine Learning*. arXiv, 2026.

[4] Nikolaos Bousias, Stefanos Pertigkiozoglou, Kostas Daniilidis, and George Pappas. Symmetries-enhanced Multi-Agent Reinforcement Learning. In *Proceedings of the 7th Annual Learning for Dynamics \& Control Conference*, pages 999–1011. PMLR, May 2025.

[5] Evangelos Chatzipantazis, Nishanth Rao, and Kostas Daniilidis. STRiDE: STate-space Riemannian Diffusion for Equivariant Planning. In *Proceedings of the 7th Annual Learning for Dynamics \& Control Conference*, pages 1338–1352. PMLR, May 2025.

[6] Pranav Atreya, Karl Pertsch, Tony Lee, Moo Jin Kim, Arhan Jain, Artur Kuramshin, Clemens Eppner, Cyrus Neary, Edward Hu, Fabio Ramos, and others. RoboArena: Distributed Real-World Evaluation of Generalist Robot Policies. In *Proceedings of the Conference on Robot Learning (CoRL 2025)*, 2025.

[7] Anthony Bisulco, Vijay Kumar, and Kostas Daniilidis. EV-TTC: Event-Based Time to Collision under Low Light Conditions. *IEEE Robotics and Automation Letters*, pages 1–8, 2025.

[8] Friedhelm Hamann, Daniel Gehrig, Filbert Febryanto, Kostas Daniilidis, and Guillermo Gallego. ETAP: Event-based Tracking of Any Point. In *Computer Vision Pattern Recognition*. IEEE, 2025.

[9] Royina Jayanth, Yinshuang Xu, Daniel Gehrig, Ziyun Wang, Evangelos Chatzipantazis, and Kostas Daniilidis. EqNIO: Subequivariant Neural Inertial Odometry. In *Int. Conference Learning Representations (ICLR)*, 2025.

[10] Wen Jiang, Boshu Lei, Katrina Ashton, Katrina, and Kostas Daniilidis. Multimodal LLM Guided Exploration and Active Mapping using Fisher Information. In *Int. Conf. Comput. Vis. (ICCV)*, 2025.

[11] Jiahui Lei, Yijia Weng, Adam Harley, Leonidas Guibas, and Kostas Daniilidis. MoSca: Dynamic Gaussian Fusion from Casual Videos via 4D Motion Scaffolds. In *Computer Vision Pattern Recognition*. IEEE, 2025. arXiv:2405.17421 [cs].

[12] Georgios Mentzelopoulos, Ioannis Asmanis, Konrad Kording, Eva Dyer, Kostas Daniilidis, and Flavia Vitale. A Scalable, Causal, and Energy Efficient Framework for Neural Decoding with Spiking Neural Networks. In *Thirty-ninth Annual Conf. on Neural Information Processing Systems (NeurIPS)*, 2025.

[13] Linzhan Mou, Jiahui Lei, Chen Wang, Lingjie Liu, and Kostas Daniilidis. DIMO: Diverse 3D Motion Generation for Arbitrary Objects. In *Int. Conf. Comput. Vis. (ICCV)*, 2025.

[14] Jayanth Royina, Yinshuang Xu, Kostas Daniilidis, Evangelos Chatzipantazis, Daniel Gehrig, and Kostas Daniilidis. Neural Inertial Odometry from Lie Events. In *Robotics: Science and Systems*, 2025.

[15] Matthew Strong, Boshu Lei, Aiden Swann, Wen Jiang, Kostas Daniilidis, and Monroe Kennedy III. Next Best Sense: Guiding Vision and Touch with FisherRF for 3D Gaussian Splatting. In *Int. Conf. Robotics and Automation (ICRA)*, 2025.

[16] Yufu Wang, Yu Sun, Priyanka Patel, Kostas Daniilidis, Michael J. Black, and Muhammed Kocabas. PromptHMR: Promptable Human Mesh Recovery. In *Computer Vision Pattern Recognition*. IEEE, 2025. arXiv:2504.06397 [cs].

[17] Ziyun Wang, Ruijun Zhang, Zi-yan Liu, Yufu Wang, and Kostas Daniilidis. Continuous-Time Human Motion Field from Event Cameras. In *Int. Conf. Comput. Vis. (ICCV)*, 2025.

[18] Georgios Mentzelopoulos, Evangelos Chatzipantazis, Ashwin G. Ramayya, Michelle Hedlund, Vivek Buch, Kostas Daniilidis, Konrad Kording, and Flavia Vitale. Neural decoding from stereotactic EEG: accounting for electrode variability across subjects. In *The Thirty-eighth Annual Conference on Neural Information Processing Systems*, November 2024.

[19] Stefanos Pertigkiozoglou, Evangelos Chatzipantazis, Shubhendu Trivedi, and Kostas Daniilidis. Improving Equivariant Model Training via Constraint Relaxation. In *The Thirty-eighth Annual Conference on Neural Information Processing Systems*, November 2024.

[20] Yinshuang Xu, Dian Chen, Katherine Liu, Sergey Zakharov, Rares Andrei Ambrus, Kostas Daniilidis, and Vitor Campagnolo Guizilini. $SE(3)$ Equivariant Ray Embeddings for Implicit Multi-View Depth Estimation. In *The Thirty-eighth Annual Conference on Neural Information Processing Systems*, November 2024.

[21] Stefanos Pertigkiozoglou, Evangelos Chatzipantazis, and Kostas Daniilidis. BiEquiFormer: Bi-Equivariant Representations for Global Point Cloud Registration. In *Symmetry and Geometry in Neural Representations*. arXiv, August 2024. arXiv:2407.08729.

[22] Friedhelm Hamann, Ziyun Wang, Ioannis Asmanis, Kenneth Chaney, Guillermo Gallego, and Kostas Daniilidis. Motion-Prior Contrast Maximization for Dense Continuous-Time Motion Estimation. In Aleš Leonardis, Elisa Ricci, Stefan Roth, Olga Russakovsky, Torsten Sattler, and Gül Varol, editors, *Computer Vision – ECCV 2024*, volume 15061, pages 18–37, Cham, 2024. Springer Nature Switzerland. Series Title: Lecture Notes in Computer Science.

[23] Wen Jiang, Boshu Lei, and Kostas Daniilidis. FisherRF: Active View Selection and Mapping with Radiance Fields Using Fisher Information. In Aleš Leonardis, Elisa Ricci, Stefan Roth, Olga Russakovsky, Torsten Sattler, and Gül Varol, editors, *Computer Vision – ECCV 2024*, volume 15071, pages 422–440, Cham, 2024. Springer Nature Switzerland. Series Title: Lecture Notes in Computer Science.

[24] Agelos Kratimenos, Jiahui Lei, and Kostas Daniilidis. DynMF: Neural Motion Factorization for Real-Time Dynamic View Synthesis with 3D Gaussian Splatting. In Aleš Leonardis, Elisa Ricci, Stefan Roth, Olga Russakovsky, Torsten Sattler, and Gül Varol, editors, *Computer Vision – ECCV 2024*, volume 15137, pages 252–269, Cham, 2024. Springer Nature Switzerland. Series Title: Lecture Notes in Computer Science.

[25] Jiahui Lei, Yufu Wang, Georgios Pavlakos, Lingjie Liu, and Kostas Daniilidis. GART: Gaussian Articulated Template Models. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*, pages 19876–19887, 2024.

[26] Yunzhou Song, Jiahui Lei, Ziyun Wang, Lingjie Liu, and Kostas Daniilidis. Track Everything Everywhere Fast and Robustly. In Aleš Leonardis, Elisa Ricci, Stefan Roth, Olga Russakovsky, Torsten Sattler, and Gül Varol, editors, *Computer Vision – ECCV 2024*, volume 15061, pages 343–359, Cham, 2024. Springer Nature Switzerland. Series Title: Lecture Notes in Computer Science.

[27] Yufu Wang, Ziyun Wang, Lingjie Liu, and Kostas Daniilidis. TRAM: Global Trajectory and Motion of 3D Humans from in-the-Wild Videos. In Aleš Leonardis, Elisa Ricci, Stefan Roth, Olga Russakovsky, Torsten Sattler, and Gül Varol, editors, *Computer Vision – ECCV 2024*, volume 15069, pages 467–487, Cham, 2024. Springer Nature Switzerland. Series Title: Lecture Notes in Computer Science.

[28] Ziyun Wang, Jinyuan Guo, and Kostas Daniilidis. Un-EVIMO: Unsupervised Event-Based Independent Motion Segmentation. In Aleš Leonardis, Elisa Ricci, Stefan Roth, Olga Russakovsky, Torsten Sattler, and Gül Varol, editors, *Computer Vision – ECCV 2024*, volume 15074, pages 228–245. Springer Nature Switzerland, 2024. Series Title: Lecture Notes in Computer Science.

[29] Congyue Deng, Jiahui Lei, Bokui Shen, Kostas Daniilidis, and Leonidas Guibas. Banana: Banach Fixed-Point Network for Pointcloud Segmentation with Inter-Part Equivariance. In *Thirty-seventh Conference on Neural Information Processing Systems*, November 2023.

[30] Jiahui Lei, Congyue Deng, Bokui Shen, Leonidas Guibas, and Kostas Daniilidis. NAP: Neural 3D Articulated Object Prior. In *Thirty-seventh Conference on Neural Information Processing Systems*, November 2023.

[31] Yinshuang Xu, Jiahui Lei, and Kostas Daniilidis. SE(3) Equivariant Convolution and Transformer in Ray Space. In *Thirty-seventh Conference on Neural Information Processing Systems*, November 2023.

[32] Kenneth Chaney, Fernando Cladera, Ziyun Wang, Anthony Bisulco, M. Ani Hsieh, Christopher Korpela, Vijay Kumar, Camillo J. Taylor, and Kostas Daniilidis. M3ED: Multi-Robot, Multi-Sensor, Multi-Environment Event Dataset. In *2023 IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, pages 4016–4023, June 2023.

[33] Shiting Xiao, Yufu Wang, Ammon Perkes, Bernd Pfrommer, Marc Schmidt, Kostas Daniilidis, and Marc Badger. Multi-view Tracking, Re-ID, and Social Network Analysis of a Flock of Visually Similar Birds in an Outdoor Aviary. *International Journal of Computer Vision*, 131(6):1532–1549, June 2023.

[34] Evangelos Chatzipantazis, Stefanos Pertigkiozoglou, Kostas Daniilidis, and Edgar Dobriban. Learning Augmentation Distributions using Transformed Risk Minimization. *Transactions on Machine Learning Research*, March 2023.

[35] Evangelos Chatzipantazis, Stefanos Pertigkiozoglou, Edgar Dobriban, and Kostas Daniilidis. SE(3)-Equivariant Attention Networks for Shape Reconstruction in Function Space. In *Int. Conference Learning Representations ICLR*, February 2023.

[36] Jiahui Lei, Congyue Deng, Schmeckpeper, Karl, Guibas, Leonidas, and Daniilidis, Kostas. EFEM: Equivariant Neural Field Expectation Maximization for 3D Object Segmentation Without Scene Supervision. In *IEEE Computer Vision Pattern Recognition (CVPR)*, 2023.

[37] Yiming Wang, Qin Han, Marc Habermann, Kostas Daniilidis, Christian Theobalt, and Lingjie Liu. NeuS2: Fast Learning of Neural Implicit Surfaces for Multi-view Reconstruction. In *Proceedings of the IEEE/CVF International Conference on Computer Vision*, pages 3295–3306, 2023.

[38] Yufu Wang and Kostas Daniilidis. ReFit: Recurrent Fitting Network for 3D Human Recovery. In *Proceedings of the IEEE/CVF International Conference on Computer Vision*, pages 14644–14654, 2023.

[39] Jiahui Lei and Kostas Daniilidis. CaDeX: Learning Canonical Deformation Coordinate Space for Dynamic Surface Representation via Neural Homeomorphism. In *2022 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, pages 6614–6624, New Orleans, LA, USA, June 2022. IEEE.

[40] Georgios Georgakis, Bernadette Bucher, Anton Arapin, Karl Schmeckpeper, Nikolai Matni, and Kostas Daniilidis. Uncertainty-driven Planner for Exploration and Navigation. In *2022 International Conference on Robotics and Automation (ICRA)*, pages 11295–11302, May 2022.

[41] Georgios Georgakis, Bernadette Bucher, Karl Schmeckpeper, Siddharth Singh, and Kostas Daniilidis. Learning to Map for Active Semantic Goal Navigation. In *Int. Conference Learning Representations ICLR*, January 2022.

[42] Georgios Georgakis, Karl Schmeckpeper, Karan Wanchoo, Soham Dan, Eleni Miltsakaki, Dan Roth, and Kostas Daniilidis. Cross-modal map learning for vision and language navigation. In *Proceedings of the IEEE/CVF conference on computer vision and pattern recognition*, pages 15460–15470, 2022.

[43] Tejas Mane, Aylar Bayramova, Kostas Daniilidis, Philippos Mordohai, and Elena Bernardis. Single-camera 3D head fitting for mixed reality clinical applications. *Computer Vision and Image Understanding*, 218:103384, 2022.

[44] Vasileios Vasilopoulos, Georgios Pavlakos, Karl Schmeckpeper, Kostas Daniilidis, and Daniel E Koditschek. Reactive navigation in partially familiar planar environments using semantic perceptual feedback. *The International Journal of Robotics Research*, 41(1):85–126, 2022.

[45] Ziyun Wang, Kenneth Chaney, Kenneth, and Kostas Daniilidis. EvAC3D: From Event-Based Apparent Contours to 3D Models via Continuous Visual HullsWang Ziyun. In *European Conference on Computer Vision*, 2022.

[46] Ziyun Wang, Fernando Cladera Ojeda, Anthony Bisulco, Daewon Lee, Camillo J Taylor, Kostas Daniilidis, M Ani Hsieh, Daniel D Lee, and Volkan Isler. EV-Catcher: High-Speed Object Catching Using Low-Latency Event-Based Neural Networks. *IEEE Robotics and Automation Letters*, 7(4):8737–8744, 2022.

[47] Yinshuang Xu, Jiahui Lei, Edgar Dobriban, and Kostas Daniilidis. Unified Fourier-based Kernel and Nonlinearity Design for Equivariant Networks on Homogeneous Spaces. In *Int. Conference on Machine Learning*, pages 24596–24614. PMLR, 2022.

[48] Kostas Daniilidis, Leonidas Guibas, Lydia Kavraki, Petros Koumoutsakos, Kostas Kyriakopoulos, John Lygeros, George J. Pappas, Michael Triantafyllou, and Panagiotis Tsiotras. Robotics in the AI era: A vision for a Hellenic Robotics Initiative. In *Foundations and Trends® in Robotics*, volume 9, pages 201–265. Now Publishers, Inc., December 2021.

[49] Bernadette Bucher, Karl Schmeckpeper, Nikolai Matni, and Kostas Daniilidis. An Adversarial Objective for Scalable Exploration. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2021.

[50] Kenneth Chaney, Artemis Panagopoulou, Chankyu Lee, Kaushik Roy, and Kostas Daniilidis. Self-Supervised Optical Flow with Spiking Neural Networks and Event Based Cameras. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2021.

[51] Nikos Kolotouros, Georgios Pavlakos, Dinesh Jayaraman, and Kostas Daniilidis. Probabilistic Modeling for Human Mesh Recovery. In *Int. Conf. Computer Vision (ICCV)*, 2021.

[52] Oleh Rybkin, Kostas Daniilidis, and Sergey Levine. Simple and Effective VAE Training with Calibrated Decoders. In *Int. Conf. Machine Learning, ICML*, 2021.

[53] Oleh Rybkin, Chuning Zhu, Anusha Nagabandi, Kostas Daniilidis, Igor Mordatch, and Sergey Levine. Model-Based Reinforcement Learning via Latent-Space Collocation. In *Int. Conf. Machine Learning, ICML*, 2021.

[54] Karl Schmeckpeper, Georgios Georgakis, and Kostas Daniilidis. Object-centric Video Prediction without Annotation. In *Int. Conf. Robotics and Automation (ICRA)*, 2021.

[55] Yufu Wang, Nikos Kolotouros, Kostas Daniilidis, and Marc Badger. Birds of a Feather: Capturing Avian Shape Models From Images. In *IEEE Computer Vision Pattern Recognition, CVPR*, 2021.

[56] Jianqiao Wangni, Dahua Lin, Ji Liu, Kostas Daniilidis, and Jianbo Shi. Towards Statistically Provable Geometric 3D Human Pose Recovery. *SIAM Journal on Imaging Sciences*, 14(1):246–270, 2021.

[57] Wenbo Zhang, Karl Schmeckpeper, Pratik Chaudhari, and Kostas Daniilidis. Deformable Linear Object Prediction Using Locally Linear Latent Dynamics. In *Int. Conf. Robotics and Automation ICRA*, 2021.

[58] Karl Pertsch, Oleh Rybkin, Jingyun Yang, Shenghao Zhou, Konstantinos Derpanis, Kostas Daniilidis, Joseph Lim, and Andrew Jaegle. Keyframing the Future: Keyframe Discovery for Visual Prediction and Planning. In Alexandre M. Bayen, Ali Jadbabaie, George Pappas, Pablo A. Parrilo, Benjamin Recht, Claire Tomlin, and Melanie Zeilinger, editors, *Proceedings of Machine Learning Research, Learning for Dynamics and Control L4DC*, volume 120, pages 969–979, The Cloud, June 2020. PMLR.

[59] Marc Badger, Yufu Wang, Adarsh Modh, Ammon Perkes, Nikos Kolotouros, Bernd G. Pfrommer, Marc F. Schmidt, and Kostas Daniilidis. 3D Bird Reconstruction: a Dataset, Model, and Shape Recovery from a Single View. In *European Conference on Computer Vision (ECCV)*, 2020.

[60] Carlos Esteves, Christine Allen-Blanchette, Ameesh Makadia, and Kostas Daniilidis. Learning SO(3) Equivariant Representations with Spherical CNNs. *Int. Journal of Computer Vision*, 128(3):588–600, 2020.

[61] Carlos Esteves, Ameesh Makadia, and Kostas Daniilidis. Spin-weighted spherical CNNs. In *Neural Information Processing Systems*, 2020.

[62] G. Gallego, T. Delbruck, G. M. Orchard, C. Bartolozzi, B. Taba, A. Censi, S. Leutenegger, A. Davison, J. Conradt, K. Daniilidis, and D. Scaramuzza. Event-based Vision: A Survey. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, pages 1–1, 2020.

[63] W. Jiang, N. Kolotouros, G. Pavlakos, X. Zhou, and K. Daniilidis. Coherent Reconstruction of Multiple Humans From a Single Image. In *2020 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, pages 5578–5587, 2020.

[64] Chankyu Lee, Adarsh Kumar Kosta, Alex Zihao Zhu, Kenneth Chaney, Kostas Daniilidis, and Kaushik Roy. Spike-FlowNet: Event-based Optical Flow Estimation with Energy-Efficient Hybrid Neural Networks. In *European Conference on Computer Vision (ECCV)*, 2020.

[65] Spyridon Leonardos, Xiaowei Zhou, and Kostas Daniilidis. A Low-Rank Matrix Approximation Approach to Multiway Matching with Applications in Multi-Sensory Data Association. In *Int. Conf. Robotics and Automation (ICRA)*, 2020.

[66] W. Liu, D. Caruso, E. Ilg, J. Dong, A. I. Mourikis, K. Daniilidis, V. Kumar, and J. Engel. TLIO: Tight Learned Inertial Odometry. *IEEE Robotics and Automation Letters*, 5(4):5653–5660, 2020.

[67] Karl Schmeckpeper, Oleh Rybkin, Kostas Daniilidis, Sergey Levine, and Chelsea Finn. Reinforcement Learning with Videos: Combining Offline Observations with Interaction. In *Conf. Robot Learning, CoRL*, 2020.

[68] Karl Schmeckpeper, Annie Xie, Oleh Rybkin, Stephen Tian, Kostas Daniilidis, Sergey Levine, and Chelsea Finn. Learning Predictive Models from Observation and Interaction. In *European Conference on Computer Vision (ECCV)*, 2020.

[69] Ramanan Sekar, Oleg Rybkin, Kostas Daniilidis, Pieter Abbeel, Danijar Hafner, and Deepak Pathak. Planning to Explore via Self-Supervised World Models. In *Int. Conf. Machine Learning (ICML)*, 2020.

[70] V. Vasilopoulos, G. Pavlakos, S. L. Bowman, J. D. Caporale, K. Daniilidis, G. J. Pappas, and D. E. Koditschek. Reactive Semantic Planning in Unexplored Semantic Environments Using Deep Perceptual Feedback. *IEEE Robotics and Automation Letters*, 5(3):4455–4462, 2020.

[71] Kenneth Chaney, Alex Zihao Zhu, and Kostas Daniilidis. Learning Event-Based Height From Plane and Parallax. In *Proceedings of IEEE IROS Int. Robotics Systems*, 2019.

[72] Carlos Esteves, Avneesh Sud, Zhengyi Luo, Xiaowei Zhou, Kostas Daniilidis, and Ameesh Makadia. Cross-Domain 3D Equivariant Image Embeddings. In *Int. Conf. Machine Learning*, 2019.

[73] Carlos Esteves, Yinshuang Xu, Christine Allen-Blanchette, and Kostas Daniilidis. Equivariant Multi-View Networks. In *Proceedings of the IEEE International Conference on Computer Vision*, 2019.

[74] Monroe Kennedy, Karl Schmeckpeper, Dinesh Thakur, Chenfanfu Jiang, Vijay Kumar, and Kostas Daniilidis. Autonomous Precision Pouring From Unknown Containers. *IEEE Robotics and Automation Letters*, 4(3):2317–2324, 2019.

[75] Nikos Kolotouros, Georgios Pavlakos, Michael J. Black, and Kostas Daniilidis. Learning to Reconstruct 3D Human Pose and Shape via Model-Fitting in the Loop. In *Proceedings of the IEEE International Conference on Computer Vision*, 2019.

[76] Nikos Kolotouros, Georgios Pavlakos, and Kostas Daniilidis. Convolutional Mesh Regression for Single-Image Human Shape Reconstruction. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, pages 4501–4510, 2019.

[77] Georgios Pavlakos, Nikos Kolotouros, and Kostas Daniilidis. TexturePose: Supervising Human Mesh Estimation With Texture Consistency. In *Proceedings of the IEEE International Conference on Computer Vision*, 2019.

[78] Oleh Rybkin, Karl Pertsch, Konstantinos G Derpanis, Kostas Daniilidis, and Andrew Jaegle. Learning what you can do before doing anything. In *Int. Conference Learning Representations*, 2019.

[79] Alex Zihao Zhu, Liangzhe Yuan, Kenneth Chaney, and Kostas Daniilidis. Unsupervised event-based learning of optical flow, depth, and egomotion. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, pages 989–997, 2019.

[80] Carlos Esteves, Christine Allen-Blanchette, Xiaowei Zhou, and Kostas Daniilidis. Polar Transformer Networks. In *Int. Conference Learning Representations*, 2018.

[81] Carlos Esteves, Kostas Daniilidis, Ameesh Makadia, and Christine Allec-Blanchette. Learning SO(3) Equivariant Representations with Spherical CNNs. In *Proceedings of the European Conference on Computer Vision (ECCV)*, pages 52–68, 2018.

[82] Andrew Jaegle, Stephen Phillips, Daphne Ippolito, and Kostas Daniilidis. Understanding image motion with group representations. In *Int. Conference on Learning Representations*, 2018.

[83] Spyridon Leonardos and Kostas Daniilidis. A Distributed Optimization Approach to Consistent Multiway Matching. In *Decision and Control (CDC), 2017 IEEE 56th Annual Conference on*, 2018.

[84] Spyridon Leonardos and Kostas Daniilidis. A Distributed Optimization Approach to Consistent Multiway Matching. In *2018 IEEE Conference on Decision and Control (CDC)*, pages 89–96. IEEE, 2018.

[85] Wenxin Liu, Giuseppe Loianno, Kartik Mohta, Kostas Daniilidis, and Vijay Kumar. Semi-Dense Visual-Inertial Odometry and Mapping for Quadrotors with SWAP Constraints. In *2018 IEEE International Conference on Robotics and Automation, ICRA 2018, Brisbane, Australia, May 21-25, 2018*, pages 1–6, 2018.

[86] Kartik Mohta, Michael Watterson, Yash Mulgaonkar, Sikang Liu, Chao Qu, Anurag Makineni, Kelsey Saulnier, Ke Sun, Alex Zhu, Jeffrey Delmerico, and others. Fast, autonomous flight in GPS-denied and cluttered environments (vol 35, pg 101, 2018). *Journal of Field Robotics*, 35(3):417–417, 2018.

[87] Georgios Pavlakos, Xiaowei Zhou, and Kostas Daniilidis. Ordinal depth supervision for 3d human pose estimation. In *IEEE Comp. Vis. Pattern Recog. (CVPR)*, 2018.

[88] Georgios Pavlakos, Luyang Zhu, Xiaowei Zhou, and Kostas Daniilidis. Learning to Estimate 3D Human Pose and Shape from a Single Color Image. In *IEEE Comp. Vis. Pattern Recog. (CVPR)*, 2018.

[89] Qianqian Wang, Xiaowei Zhou, and Kostas Daniilidis. Multi-Image Semantic Matching by Mining Consistent Features. In *IEEE Comp. Vision Pattern Recognition*, 2018.

[90] Xiaowei Zhou, Sikang Liu, Georgios Pavlakos, Vijay Kumar, and Kostas Daniilidis. Human Motion Capture Using a Drone. In *IEEE Int. Conf. Robotics and Automation*, 2018.

[91] Xiaowei Zhou, Menglong Zhu, Georgios Pavlakos, Spyridon Leonardos, Konstantinos G Derpanis, and Kostas Daniilidis. Monocap: Monocular human motion capture using a CNN coupled with a geometric prior. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 2018.

[92] Alex Zihao Zhu, Yibo Chen, and Kostas Daniilidis. Realtime Time Synchronized Event-based Stereo. In *European Conference on Computer Vision*, 2018.

[93] Alex Zihao Zhu, Dinesh Thakur, Tolga Ozaslan, Bernd Pfrommer, Vijay Kumar, and Kostas Daniilidis. The Multi Vehicle Stereo Event Camera Dataset: An Event Camera Dataset for 3D Perception. *IEEE Robotics and Automation Letters*, 3(3):2032–2039, 2018.

[94] Alex Zihao Zhu, Liangzhe Yuan, Kenneth Chaney, and Kostas Daniilidis. EV-FlowNet: Self-Supervised Optical Flow Estimation for Event-based Cameras. In *Robotics: Science and Systems*, 2018.

[95] S. Bowmann, N. Atanasov, K. Daniilidis, and G. J. Pappas. Probabilistic Data Association for Semantic SLAM. In *IEEE Int. Conf. Robotics and Automation (ICRA)*, 2017.

[96] Jonas Cleveland, Dinesh Thakur, Philip Dames, Cody Phillips, Terry Kientz, Kostas Daniilidis, John Bergstrom, and Vijay Kumar. Automated System for Semantic Object Labeling With Soft-Object Recognition and Dynamic Programming Segmentation. *IEEE Transactions on Automation Science and Engineering*, 14(2):820–833, 2017.

[97] Monroe Kennedy III, Kendall Queen, Dinesh Thakur, Kostas Daniilidis, and Vijay Kumar. Precise Dispensing of Liquids Using Visual Feedback. In *Intelligent Robots and Systems (IROS), 2017 IEEE/RSJ International Conference on*, 2017.

[98] S. Leonardos, N. Atanasov, and K. Daniilidis. Distributed Consistent Data Association. In *IEEE Int. Conf. Robotics and Automation (ICRA)*, 2017.

[99] Spyridon Leonardos, Victor Preciado, and Kostas Daniilidis. A dynamical systems approach to distributed eigenvector computation. In *Decision and Control (CDC), 2017 IEEE 56th Annual Conference on*, pages 2209–2215. IEEE, 2017.

[100] Georgios Pavlakos, Xiaowei Zhou, Aaron Chan, Konstantinos G Derpanis, and Kostas Daniilidis. 6-dof object pose from semantic keypoints. In *IEEE Int. Conf. Robotics and Automation*, 2017.

[101] Georgios Pavlakos, Xiaowei Zhou, Konstantinos G Derpanis, and Kostas Daniilidis. Coarse-to-Fine Volumetric Prediction for Single-Image 3D Human Pose. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, 2017.

[102] Georgios Pavlakos, Xiaowei Zhou, Konstantinos G Derpanis, and Kostas Daniilidis. Harvesting Multiple Views for Marker-less 3D Human Pose Annotations. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, 2017.

[103] B. Pfrommer, N. Sanket, K. Daniilidis, and J. Cleveland. PennCOSYVIO: A Challenging Visual Inertial Odometry Benchmark. In *IEEE Int. Conf. Robotics and Automation (ICRA)*, 2017.

[104] Justin Thomas, Jake Welde, Giuseppe Loianno, Kostas Daniilidis, and Vijay Kumar. Autonomous Flight for Detection, Localization, and Tracking of Moving Targets With a Small Quadrotor. *IEEE Robotics and Automation Letters*, 2(3):1762–1769, 2017.

[105] R. Tron, X. Zhou, C. Esteves, and K. Daniilidis. Fast Multi-Image Matching via Density-Based Clustering. In *IEEE Int. Conference Computer Vision*, 2017.

[106] Roberto Tron and Kostas Daniilidis. The space of essential matrices as a Riemannian quotient manifold. *SIAM Journal on Imaging Sciences*, 2017.

[107] M. M. Zhang, N. Atanasov, and K. Daniilidis. Active end-effector pose selection for tactile object recognition through monte carlo tree search. In *Intelligent Robots and Systems (IROS), 2017 IEEE/RSJ International Conference on*, 2017.

[108] Alex Zhu, Nikolay Atanasov, and Kostas Daniilidis. Event-based Feature Tracking with Probabilistic Data Association. In *IEEE International Conference on Robotics and Automation (ICRA)*, 2017.

[109] Alex Zhu, Nikolay Atanasov, and Kostas Daniilidis. Event-based Visual Inertial Odometry. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, 2017. Journal Abbreviation: IEEE Computer Vision Pattern Recognition (CVPR).

[110] Nikolay Atanasov, Menglong Zhu, Kostas Daniilidis, and George J Pappas. Localization from semantic observations via the matrix permanent. *The International Journal of Robotics Research*, 35(1-3):73–99, 2016.

[111] K. Daniilidis and Danica Kragic. 3D Vision and Recognition. In O. Khatib and B. Siciliano, editors, *Handbook of Robotics*. Springer Verlag, 2016.

[112] Andrew Jaegle, Stephen Phillips, and Kostas Daniilidis. Fast, Robust, Continuous Monocular Egomotion Computation. In *IEEE Int. Conf. Robotics and Automation*, 2016.

[113] Spyridon Leonardos and Kostas Daniilidis. A Game-Theoretic Approach to Robust Fusion and Kalman Filtering Under Unknown Correlations. In *American Control Conference ACC*, 2016.

[114] Spyridon Leonardos, Xiaowei Zhou, and Kostas Daniilidis. Articulated Motion Estimation from a Monocular Image Sequence Using Spherical Tangent Bundles. In *IEEE Int. Conf. Robotics and Automation (ICRA)*, 2016.

[115] C. Phillips, M. Lecce, and K. Daniilidis. Seeing Glassware. In *Robotics Science and Systems*, 2016.

[116] Cody J Phillips, Matthieu Lecce, and Kostas Daniilidis. Seeing glassware: from edge detection to pose estimation and shape recovery. In *Robotics: Science and Systems*, volume 3, 2016.

[117] Justin Thomas, Giuseppe Loianno, Kostas Daniilidis, and Vijay Kumar. Visual Servoing of Quadrotors for Perching by Hanging from Cylindrical Objects. *IEEE Robotics and Automation Letters*, 2016.

[118] Roberto Tron, Justin Thomas, Giuseppe Loianno, Kostas Daniilidis, and Vijay Kumar. Bearing-only formation control with auxiliary distance measurements, leaders, and collision avoidance. In *Decision and Control (CDC), 2016 IEEE 55th Conference on*, pages 1806–1813. IEEE, 2016.

[119] Mabel M Zhang, Monroe D Kennedy, M Ani Hsieh, and Kostas Daniilidis. A triangle histogram for object classification by tactile sensing. In *Intelligent Robots and Systems (IROS), 2016 IEEE/RSJ International Conference on*, pages 4931–4938. IEEE, 2016.

[120] Xiaowei Zhou, Menglong Zhu, Spyridon Leonardos, Kosta Derpanis, and Kostas Daniilidis. Sparseness Meets Deepness: 3D Human Pose Estimation from Monocular Video. In *IEEE Computer Vision Pattern Recognition (CVPR)*, 2016.

[121] Nikolay Atanasov, Jerome Le Ny, Kostas Daniilidis, and George J Pappas. Decentralized active information acquisition: theory and application to multi-robot SLAM. In *Robotics and Automation (ICRA), 2015 IEEE International Conference on*, pages 4775–4782. IEEE, 2015.

[122] Luca Carlone, Roberto Tron, Kostas Daniilidis, and Frank Dellaert. Initialization techniques for 3D SLAM: a survey on rotation estimation and its use in pose graph optimization. In *Robotics and Automation (ICRA), 2015 IEEE International Conference on*, pages 4597–4604. IEEE, 2015.

[123] Jonas Cleveland, Dinesh Thakur, Philip Dames, Cody Phillips, Terry Kientz, Kostas Daniilidis, John Bergstrom, and Vijay Kumar. An automated system for semantic object labeling with soft object recognition and dynamic programming segmentation. In *Automation Science and Engineering (CASE), 2015 IEEE International Conference on*, pages 683–690. IEEE, 2015.

[124] Bhoram Lee, Kostas Daniilidis, and Daniel D Lee. Online self-supervised monocular visual odometry for ground vehicles. In *Robotics and Automation (ICRA), 2015 IEEE International Conference on*, pages 5232–5238. IEEE, 2015.

[125] Jason L Owens, Philip R Osteen, and Kostas Daniilidis. MSG-cal: Multi-sensor graph-based calibration. In *Intelligent Robots and Systems (IROS), 2015 IEEE/RSJ International Conference on*, pages 3660–3667. IEEE, 2015.

[126] Georgios Pavlakos and Kostas Daniilidis. Reconstruction of 3D Pose for Surfaces of Revolution from Range Data. In *3D Vision (3DV), 2015 International Conference on*, pages 648–656. IEEE, 2015.

[127] Cody J Phillips, Matthieu Lecce, Casey Davis, and Kostas Daniilidis. Grasping surfaces of revolution: Simultaneous pose and shape recovery from two views. In *Robotics and Automation (ICRA), 2015 IEEE International Conference on*, pages 1352–1359. IEEE, 2015.

[128] Roberto Tron, Luca Carlone, Frank Dellaert, and Kostas Daniilidis. Rigid components identification and rigidity enforcement in bearing-only localization using the graph cycle basis. In *American Control Conference*, 2015.

[129] Mabel Zhang, Jean Choi, Kostas Daniilidis, Michael Wolf, and Christopher Kanan. VAIS: A Dataset for Recognizing Maritime Imagery in the Visible and Infrared Spectrums. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops*, pages 10–16, 2015.

[130] Xiaowei Zhou, Spyridon Leonardos, Xiaoyan Hu, and Kostas Daniilidis. 3D shape estimation from 2D landmarks: A convex relaxation approach. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, pages 4447–4455, 2015.

[131] Xiaowei Zhou, Menglong Zhu, and Kostas Daniilidis. Multi-Image Matching via Fast Alternating Minimization. In *IEEE International Conference on Computer Vision*, 2015.

[132] Menglong Zhu, Xiaowei Zhou, and Kostas Daniilidis. Single Image Pop-Up From Discriminatively Learned Parts. In *Proceedings of the IEEE International Conference on Computer Vision*, pages 927–935, 2015.

[133] Nikolay Atanasov, Bharath Sankaran, Jerome Le Ny, George J Pappas, and Kostas Daniilidis. Nonmyopic view planning for active object classification and pose estimation. *IEEE Transactions on Robotics*, 30(5):1078–1090, 2014.

[134] Thomas Koletschka, Luis Puig, and Kostas Daniilidis. MEVO: Multi-environment stereo visual odometry. In *Intelligent Robots and Systems (IROS 2014), 2014 IEEE/RSJ International Conference on*, pages 4981–4988. IEEE, 2014.

[135] Kartik Mohta, Vipin Kumar, and Kostas Daniilidis. Vision-based control of a quadrotor for perching on lines. In *Robotics and Automation (ICRA), 2014 IEEE International Conference on*, pages 3130–3136. IEEE, 2014.

[136] Jason L Owens, Philip R Osteen, and Kostas Daniilidis. Temporally consistent segmentation of point clouds. In *SPIE Defense+ Security*, pages 90840H–90840H. International Society for Optics and Photonics, 2014.

[137] Luis Puig, Jose J Guerrero, and Kostas Daniilidis. Scale Space for Camera Invariant Features. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 36(9):1832–1846, 2014.

[138] Roberto Tron and Kostas Daniilidis. An optimization approach to bearing-only visual homing with applications to a 2-D unicycle model. In *Robotics and Automation (ICRA), 2014 IEEE International Conference on*, pages 4235–4242. IEEE, 2014.

[139] Menglong Zhu, Konstantinos G Derpanis, Yinfei Yang, Samarth Brahmbhatt, Mabel Zhang, Chris Phillips, Matthieu Lecce, and Kostas Daniilidis. Single image 3D object detection and pose estimation for grasping. In *Robotics and Automation (ICRA), 2014 IEEE International Conference on*, pages 3936–3943. IEEE, 2014.

[140] N. Atanasov, B. Sankaran, J. Le Ny, Th Koletschka, G. J. Pappas, and K. Daniilidis. Hypothesis Testing Framework for Active Object Detection. In *IEEE Int. Conf. Robotics and Automation*, 2013.

[141] M. Bansal and K. Daniilidis. Joint Spectral Correspondence for Disparate Image Matching. In *IEEE Conf. Computer Vision Pattern Recognition*, 2013.

[142] R. Anati, D. Scaramuzza, K. Derpanis, and K. Daniilidis. Robot Localization Using Soft Object Detection. In *IEEE Int. Conf. Robotics and Automation*, 2012.

[143] M. Bansal, K. Daniilidis, and H. Sawhney. Ultra-wide Baseline Facade Matching for Geo-Localization. In *ECCV Workshop on Visual Analysis and Geo-Localization of Large-Scale Imagery, A. Fusiello et al. (Eds.): ECCV 2012 Ws/Demos, Part I, LNCS 7583, pp. 175-186*, 2012.

[144] J. Butzke, K. Daniilidis, A. Kushleyev, DD Lee, M. Likhachev, C. Phillips, and M. Phillips. The University of Pennsylvania MAGIC 2010 multi-robot unmanned vehicle system. *Journal of Field Robotics*, 2012.

[145] K.G. Derpanis, M. Lecce, K. Daniilidis, and R.P. Wildes. Dynamic scene understanding: The role of orientation features in space and time in scene classification. In *Computer Vision and Pattern Recognition (IEEE Conf. Computer Vision Pattern Recognition), 2012 IEEE Conference on*, pages 1306–1313. IEEE, 2012.

[146] R. Kennedy, K. Daniilidis, O. Naroditsky, and C.J. Taylor. Identifying maximal rigid components in bearing-based localization. In *IEEE Intelligent Robots and Systems*, 2012.

[147] O. Naroditsky, X. S. Zhou, J. Gallier, S. Roumeliotis, and K. Daniilidis. Two Efficient Solutions for Visual Odometry Using Directional Correspondence. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 2012.

[148] A. Toshev, B. Taskar, and K. Daniilidis. Shape-based Object Detection via Boundary Structure Segmentation. *Int. Journal of Computer Vision*, 2012.

[149] M. Bansal, H.S. Sawhney, H. Cheng, and K. Daniilidis. Geo-localization of street views with aerial image databases. In *Proceedings of the 19th ACM international conference on Multimedia*, pages 1125–1128. ACM, 2011.

[150] K. Daniilidis C. Phillips, K. Derpanis. Transparent object detection with stereo parallax. In *1st IEEE Workshop on Challenges and Opportunities in Robot Perception*, 2011.

[151] K. Daniilidis D. Scaramuzza, A. Censi. Exploiting Motion Priors in Visual Odometry for Vehicle-Mounted Cameras with Non-holonomic Constraints. In *IEEE Intelligent Robots and Systems*, 2011.

[152] O. Naroditsky and K. Daniilidis. Optimizing Polynomial Solvers for Minimal Geometry Problems. In *IEEE Int. Conf.Computer Vision*, 2011.

[153] O. Naroditsky, A. Patterson, and K. Daniilidis. Automatic Alignment of a Camera with a Line Scan LIDAR System. In *IEEE Int. Conf. Robotics and Automation*, 2011.

[154] Ameesh Makadia and Kostas Daniilidis. Spherical Correlation of Visual Representations for 3D Model Retrieval. *International Journal of Computer Vision*, 89(2):193–210, September 2010.

[155] Kostas Daniilidis, Petros Maragos, and Nikos Paragios, editors. *Computer Vision – ECCV 2010: 11th European Conference on Computer Vision, Heraklion, Crete, Greece, September 5-11, 2010, Proceedings, Part II*, volume 6312 of *Lecture Notes in Computer Science*. Springer, Berlin, Heidelberg, 2010.

[156] A. Toshev, B. Taskar, and K. Daniilidis. Object Detection via Boundary Structure Segmentation,. In *IEEE Comp. Vision Pattern Recognition*, 2010.

[157] R. Anati and K. Daniilidis. Constructing Topological Maps using Markov Random Fields and Loop-Closure Detection. In *Neural Information Processing Systems (NIPS) Conference*, 2009.

[158] G. L. Mariottini, F. Morbidi, D. Prattichizzo, N. Vander Val, N. Michael, G. J. Pappas, and K. Daniilidis. Vision-based localization of leader-follower formations. *IEEE Transactions on Robotics*, 2009.

[159] N. Moshtagh, N. Michael, A. Jadbabaie, and K. Daniilidis. Vision-Based, Distributed Control Laws for Motion Coordination of Nonholonomic Robots. *IEEE Transactions on Robotics*, 2009.

[160] A. Toshev, A. Makadia, and K. Daniilidis. Shape-based Detection of Moving Objects in Videos. In *IEEE Comp. Vision Pattern Recognition*, 2009.

[161] A. Kumar, J. P. Tardif, R. Anati, and K. Daniilidis. Experiments on visual loop closing using vocabulary trees. In *IEEE Workshop on Visual Localization*, 2008.

[162] Y. Ling, I. Cheng, and K. Daniilidis. A Curvature-Driven Probabilistic Strategy for Transmission of Arbitrary 3D Meshes over Unreliable Networks. In *IEEE Symposium on 3D Data Processing, Visualization, and Transmission*, 2008.

[163] N. Moshtagh, N. Michael, A. Jadbabaie, and K. Daniilidis. Distributed, Bearing-Only Control Laws for Circular Formations of Ground Robots. In *Robotics: Science and Systems*. MIT Press, 2008.

[164] A. Patterson, P. Mordohai, and K. Daniilidis. Object Detection from Large-Scale 3D Datasets using Bottom-up and Top-down Descriptors. In *The 10th European Conference on Computer Vision*, 2008.

[165] J. P. Tardif, Y. Pavlidis, and K. Daniilidis. Monocular Visual Odometry in Urban Environments using an Omdirectional Camera. In *IEEE International Conference on Intelligent Robots and Systems*, 2008.

[166] Nima Moshtagh and Ali Jadbabaie. Distributed Geodesic Control Laws for Flocking of Nonholonomic Agents. *IEEE Transactions on Automatic Control*, 52(4):681–686, April 2007.

[167] P. Hansen, P. Corke, W. Boles, and K. Daniilidis. Scale-Invariant Features on the Sphere. In *IEEE Int. Conf. Computer Vision*, 2007.

[168] P. Hansen, P. Corke, W. Boles, and K. Daniilidis. Scale-Invariant Features With Wide-Angle Images. In *IEEE Int. Robotics Symposium*, 2007.

[169] A. Makadia, C. Geyer, and K. Daniilidis. Correspondence-free Structure from Motion. *Int. Journal of Computer Vision*, 75:311–327, 2007.

[170] G. L. Mariottini, F. Morbidi, D. Prattichizzo, G. J. Pappas, and K. Daniilidis. Leader-Follower Formations: Uncalibrated Vision-Based Localization and Control. In *IEEE Int. Conf. Robotics and Automation*, 2007.

[171] R. Molana and K. Daniilidis. A single-perspective novel panoramic view from radially distorted non-central images. In *British Machine Vision Conference*, 2007.

[172] A. Toshev, J. Shi, and K. Daniilidis. Image matching via saliency region correspondence. In *IEEE Conf. Computer Vision Pattern Recognition*, 2007.

[173] J. P. Barreto and K. Daniilidis. Epipolar Geometry of Central Projection Systems using Veronese Maps. In *IEEE Conf. Computer Vision Pattern Recognition*, 2006.

[174] R. Carceroni, A. Kumar, and K. Daniilidis. Structure from Motion with Known Camera Positions. In *IEEE Conf. Computer Vision Pattern Recognition*, 2006.

[175] K. Daniilidis and R. Klette. *Imaging Beyond the Pinhole Model*. Kluwer Academic Publishers, 2006.

[176] R. A. Hicks, M. Millstone, and K. Daniilidis. Realizing any central projection with a folded catadioptric sensor. *Applied Optics*, 45:7205–7210, 2006.

[177] A. Makadia and K. Daniilidis. Rotation Estimation from Spherical Images Without Correspondences. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 28:1170–1175, 2006.

[178] A. Makadia, A. Patterson, and K. Daniilidis. Fully Automatic Registration of 3D Point Clouds. In *IEEE Conf. Computer Vision Pattern Recognition*, 2006.

[179] N. Moshtagh, A. Jadbabaie, and K. Daniilidis. Vision-Based Control Laws for Distributed Flocking of Nonholonomic Agents. In *IEEE Int. Conf. Robotics and Automation*, 2006.

[180] J. P. Barreto and K. Daniilidis. Fundamental Matrix for Cameras with Radial Distortion. In *Int. Conf. Computer Vision*, 2005.

[181] A. Makadia and K. Daniilidis. Correspondenceless ego-motion estimation using an IMU. In *IEEE Int. Conf. Robotics and Automation*, 2005.

[182] A. Makadia and K. Daniilidis. Planar ego-motion without correspondences. In *IEEE Workshop on Motion and Video Computing*, 2005.

[183] A. Makadia, C. Geyer, S. Sastry, and K. Daniilidis. Radon-based structure from motion without Correspondences. In *IEEE Conf. Computer Vision Pattern Recognition*, 2005.

[184] G. L. Mariottini, G. J. Pappas, D. Prattichizzo, and K.Daniilidis. Vision-based localization of leader-follower formations. In *44th IEEE Conference on Decision and Control*, 2005.

[185] N. Moshtagh, A. Jadbabaie, and K. Daniilidis. Vison-based distributed coordination of multi-agent systems. In S. Thrun, G. Sukhatme S. Schaal, and O. Brock, editors, *Robotics: Science and Systems*, pages 41–48. MIT Press, 2005.

[186] W. Yu, G. Sommer, K. Daniilidis, and J. S. Duncan. Using Skew Gabor Filter in Source Signal Separation and Local Spectral Orientation Analysis. *Image and Vision Computing*, 23:377–392, 2005.

[187] X. Zabulis, A. Patterson, and K. Daniilidis. Digitizing Archaeological Excavations from Multiple Monocular Views. In *5th International Conference on 3-D Digital Imaging and Modeling*, 2005.

[188] K. Daniilidis and N. Papanikolopoulos. *Special Issue on Panoramic Robotics of the Robotics and Automation Magazine*. IEEE, December 2004.

[189] J. P. Barreto and K. Daniilidis. Unifying Image Plane Liftings for Central Catadioptric and Dioptric Cameras. In *Workshop on Omnidirectional Vision and Camera Networks*, 2004.

[190] J. P. Barreto and K. Daniilidis. Wide Area Multiple Camera Calibration and Estimation of Radial Distortion. In *Workshop on Omnidirectional Vision and Camera Networks*, 2004.

[191] D. Gupta and K. Daniilidis. Planar motion of a parabolic catadioptric camera. In *Proceedings of the 17th International Conference on Pattern Recognition*, volume 4, pages 68–71, 2004.

[192] D. Gupta, A. Kumar, and K. Daniilidis. Using omnidirectional structure from motion for registration of range images of minimal overlap. In *2nd International Symposium on 3D Data Processing, Visualization and Transmission*, pages 333 – 340, 2004.

[193] I. V. Isler, S. Kannan, K. Daniilidis, and P. Valtr. VC-Dimension of Exterior Visibility. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 26:667–671, 2004.

[194] V. Isler, K. Daniilidis, G. J. Pappas, and C. Belta. Hybrid Control for Visibility-Based Pursuit-Evasion Games. In *Proceedings of IEEE/RSJ International Conference on Intelligent Robots and Systems IROS*, 2004.

[195] V. Isler, S. Kannan, and K. Daniilidis. Sampling Based Sensor-Network Deployment. In *Proceedings of IEEE/RSJ International Conference on Intelligent Robots and Systems IROS*, 2004.

[196] A. Makadia, L. Sorgi, and K. Daniilidis. Rotation estimation from spherical images. In *Proceedings of the 17th International Conference on Pattern Recognition*, volume 3, pages 590–593, 2004.

[197] J. Mulligan, N. Kelshikar, X. Zabulis, and K. Daniilidis. Stereo-based Environment Scanning for Immersive Telepresence. *IEEE Trans. Circuits and Systems for Video Technology*, 14:304–320, 2004.

[198] O. Naroditsky and K. Daniilidis. 3D scanning using spatiotemporal orientation. In *Proceedings of the 17th International Conference on Pattern Recognition*, volume 1, pages 5–9, 2004.

[199] L. Sorgi and K. Daniilidis. Normalized Cross-Correlation for Spherical Images. In *European Conference on Computer Vision*, pages 542–552, 2004.

[200] W. Yu, G. Sommer, and K. Daniilidis. Using skew Gabor filter in source signal separation and local spectral multi-orientation analysis. In *IEEE Conf. Computer Vision Pattern Recognition*, pages I–462 – I–469, 2004.

[201] X. Zabulis and K. Daniilidis. Multi-camera reconstruction based on surface normal estimation and best viewpoint selection. In *2nd International Symposium on 3D Data Processing, Visualization and Transmission*, pages 733–740, 2004.

[202] A. Ansar and K. Daniilidis. Linear pose estimation from points and lines. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 25:578–589, 2003.

[203] C. Geyer and K. Daniilidis. Conformal Rectification of Omnidirectional Stereo Pairs. In *IEEE Workshop on Omnidirectional Vision and Camera Networks*, 2003.

[204] C. Geyer and K. Daniilidis. Mirrors in motion: Epipolar geometry and motion estimation. In *Int. Conference on Computer Vision*, pages 766–773, 2003.

[205] C. Geyer and K. Daniilidis. Omnidirectional video. *Visual Computer*, 19:405–416, 2003.

[206] V. Isler, S. Kannan, and K. Daniilidis. Local Exploration Algorithms: Competitive Analysis and Probabilistic Framework. In *IEEE Int. Conf. Robotics and Automation*, 2003.

[207] A. Makadia and K. Daniilidis. Direct 3D-rotation estimation from spherical images via a generalized shift theorem. In *IEEE Conf. Computer Vision Pattern Recognition*, 2003.

[208] W. Yu, G. Sommer, and K. Daniilidis. Multiple Motion Analysis: in Spatial Domain or in Spectral Domain? *Computer Vision Image Understanding*, 90:129–152, 2003.

[209] A. Ansar and K. Daniilidis. Linear Pose Estimation from Points or Lines. In *European Conference on Computer Vision*, pages 282–296, 2002.

[210] C. Geyer and K. Daniilidis. Para-cata-dioptric calibration. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 24:687–695, 2002.

[211] C. Geyer and K. Daniilidis. Properties of the Catadioptric Fundamental Matrix. In *European Conference on Computer Vision*, pages 140–154, 2002.

[212] K. Daniilidis, A. Makadia, and T. Bülow. Image Processing in Catadioptric Planes: Spatiotemporal Derivatives and Optical Flow Computation. In *IEEE Workshop on Omnidirectional Vision*, pages 3–12, 2002.

[213] J. Mulligan, V. Isler, and K. Daniilidis. Trinocular Stereo: A New Algorithm and its Evaluation. *Int. Journal of Computer Vision*, 47:51–61, 2002.

[214] H. Towles, W.-C. Chen, R. Yang, S.-U. Kum, H. Fuchs, N. Kelshikar, J. Mulligan, K. Daniilidis, L. Bolden, B. Zelesnik, A. Sadagic, and J. Lanier. 3D Tele-collaboration over Internet2. In *International Workshop on Immersive Telepresence, Juan-les-Pins, France, 06 Dec*, 2002.

[215] W. Yu, G. Sommer, S. Beauchemin, and K. Daniilidis. Oriented Structure of the Occlusion Distortion: Is It Reliable? *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 24:1286–1290, 2002.

[216] E. Angelopoulou, R. Molana, and K. Daniilidis. Multispectral skin color modelling. In *IEEE Conf. Computer Vision Pattern Recognition*, pages 635–642, 2001.

[217] A. Ansar and K. Daniilidis. Linear Solutions for Visual Augmented Reality Registration. In *Int. Symp. on Augmented Reality, Oct. 6-7, New York, NY*, pages 183–184, 2001.

[218] A. Ansar, D. Rodrigues, J. P. Desai, K. Daniilidis, V. Kumar, and M. F. M. Campos. Visual and Haptic Collaborative Tele-presence. *Computers and Graphics*, 25:789–798, 2001.

[219] C. Geyer and K. Daniilidis. Catadioptric projective geometry. *Int. Journal of Computer Vision*, 43:223–243, 2001.

[220] C. Geyer and K. Daniilidis. Structure and motion from uncalibrated catadioptric views. In *IEEE Conf. Computer Vision Pattern Recognition*, pages 279–286, 2001.

[221] J. Mulligan and K. Daniilidis. Real Time Trinocular Stereo for Tele-immersion. In *IEEE Int. Conf. Image Processing*, pages 959–962, 2001.

[222] J. Mulligan, V. Isler, and K. Daniilidis. Performance evaluation of stereo for tele-presence. In *Int. Conf. Computer Vision*, pages 558–565, 2001.

[223] W. Yu, G. Sommer, and K. Daniilidis. 3D-Orientation Signatures with Conic Kernel Filtering for Multiple Motion Analysis. In *IEEE Conf. Computer Vision Pattern Recognition*, pages 299–306, 2001.

[224] W. Yu, G. Sommer, and K. Daniilidis. Skewness of Gabor Wavelets and Source Signal Separation. In *Int. Conf. Wavelet Analysis and Applications*, 2001.

[225] Weichuan Yu, Gerald Sommer, and Kostas Daniilidis. Approximate Orientation Steerability Based on Angular Gaussians. *IEEE Transactions on Image Processing*, 10:193–205, 2001.

[226] E. Bayro-Corrochano, K. Daniilidis, and G. Sommer. Motor-Algebra for 3D Kinematics. *Journal of Mathematical Imaging and Vision*, pages 79–100, 2000.

[227] K. Daniilidis and C. Geyer. Omnidirectional Vision: Theory and Algorithms. In *IEEE Int. Conf. Pattern Recognition*, pages 89–96, 2000.

[228] C. Geyer and K. Daniilidis. Equivalence of Catadioptric Projections and Mappings of the Sphere. In *IEEE Workshop on Omnidirectional Vision*, pages 91–96, 2000.

[229] C. Geyer and K. Daniilidis. Geometric Properties of Central Catadioptric Projections. In *Proc. Workshop Algebraic Frames for Perception and Action*, pages 208–217, 2000.

[230] C. Geyer and K. Daniilidis. A unifying theory for central panoramic systems. In *European Conference on Computer Vision*, pages 445–462, 2000.

[231] R. A. Hicks, D. Pettey, K. Daniilidis, and R. Bajcsy. Complex Analysis for Reconstruction of Controlled Motion. *Journal of Mathematical Imaging and Vision*, 13:57–70, 2000.

[232] J. Mulligan and K. Daniilidis. Predicting Disparity Windows for Real-time Stereo. In *European Conference on Computer Vision*, pages 220–235, 2000.

[233] J. Mulligan and K. Daniilidis. Trinocular Stereo for Non-Parallel Configurations. In *IEEE Int. Conf. Pattern Recognition*, pages 567–570, 2000.

[234] J. Mulligan and K. Daniilidis. View-independent Scene Acquisition for Tele-Presence. In *Proc. Int. Symposium on Augmented Reality*, pages 105–110, 2000.

[235] K. Daniilidis. Hand-Eye Calibration Using Dual Quaternions. *International Journal of Robotics Research*, 18:286–298, 1999.

[236] C. Geyer and K. Daniilidis. Catadioptric Camera Calibration. In *IEEE Int. Conf. Computer Vision*, pages 398–404, 1999.

[237] R. A. Hicks, D. Pettey, K. Daniilidis, and R. Bajcsy. Complex Analysis for Reconstruction of Controlled Motion. In *Proc. 8th Int. Conf. Computer Analysis of Images and Patterns CAIP, Ljubljana*, pages 301–310, 1999.

[238] J. Mendelsohn and K. Daniilidis. Constrained Self-Calibration. In *IEEE Conf. Computer Vision Pattern Recognition*, pages 581–588, 1999.

[239] W. Yu, K. Daniilidis, S. Beauchemin, and G. Sommer. Detection and Classification of Points of Multiple Motion. In *IEEE Conf. Computer Vision Pattern Recognition*, pages 171–177, 1999.

[240] K. Daniilidis, Ch Krauss, M. Hansen, and G. Sommer. Real-Time Tracking of Moving Objects with an Active Camera. *Journal of Real Time Imaging*, 4:3–20, 1998.

[241] W. Yu, K. Daniilidis, and G. Sommer. Rotated Wedge Averaging Filters for Junction Characterization. In *IEEE Conf. Computer Vision Pattern Recognition*, pages 390–395, 1998.

[242] W. Yu, K. Daniilidis, and G. Sommer. Junction Characterization Using a Polar Pyramid. In *20. DAGM Symposium on Pattern Recognition*, 1998.

[243] W. Yu, K. Daniilidis, and G. Sommer. Low-cost Junction Characterization Using Polar Averaging Filters. In *IEEE International Conference on Image Processing (ICIP'98), Vol. 3, Chicago, Oct. 4-7*, pages 41–44, 1998.

[244] K. Daniilidis. Fixation simplifies 3D motion estimation. *Computer Vision Image Understanding*, 68:158–169, 1997.

[245] M. Hansen, K. Daniilidis, and G. Sommer. Optimization of disparity estimation using the instantaneous frequency. In *Proc. 7th Int. Conf. Computer Analysis of Images and Patterns CAIP, Kiel*, pages 321–328, 1997.

[246] K. Daniilidis. Attentive visual motion processing: computations in the log-polar plane. *Computing*, 11:1–20, 1996.

[247] K. Daniilidis and E. Bayro-Corrochano. The dual quaternion approach to hand-eye calibration. In *IEEE Int. Conf. Pattern Recognition*, pages 318–322, 1996.

[248] K. Daniilidis, M. Hansen, and G. Sommer. Real Time Pursuit and Vergence Control with an Active Binocular Head. In *Autonome Mobile Systeme*, pages 78–87, 1996.

[249] K. Daniilidis and I. Thomas. Decoupling the 3D motion space by fixation. In *European Conference on Computer Vision*, pages 685–696, 1996.

[250] K. Daniilidis and J. Ernst. Active intrinsic calibration using vanishing points. In *IEEE Conf. Computer Vision Pattern Recognition*, pages 708–713. San Francisco, CA, June 18-20, 1996.

[251] K. Daniilidis and J. Ernst. Active intrinsic calibration using vanishing points. *Pattern Recognition Letters*, 17:1179–1189, 1996.

[252] K. Daniilidis and M. Spetsakis. Understanding noise sensitivity in structure from motion. In Y. Aloimonos, editor, *Visual Navigation*, pages 61–88. Lawrence Erlbaum Associates, Hillsdale, NJ, 1996.

[253] K. Daniilidis and V. Krüger. Optical flow computation in the log-polar plane. In *V. Hlavac et al. (Ed.), Proc. Int. Conf. Computer Analysis of Images and Patterns CAIP, Prag*, pages 65–72, 1995.

[254] K. Daniilidis, M. Hansen, Ch. Krauss, and G. Sommer. Auf dem Weg zum künstlichen aktiven Sehen: Modellfreie Bewegungsverfolgung durch Kameranachführung. In *Proc. DAGM-Symposium Mustererkennung*, pages 277–284, 1995.

[255] K. Daniilidis. Rekursive Schätzung der relativen Bewegung einer Ebene aus längeren monokularen Bildfolgen. In *Proc. DAGM-Symposium Mustererkennung*, pages 35–42, 1993.

[256] K. Daniilidis and H.-H. Nagel. The coupling of rotation and translation in motion estimation of planar surfaces. In *IEEE Conf. on Computer Vision and Pattern Recognition 1993*, pages 188–193, 1993.

[257] D. Koller, K. Daniilidis, and H.-H. Nagel. Model-based object tracking in monocular image sequences of road-traffic scenes. *International Journal of Computer Vision*, 10:257–281, 1993.

[258] K. Daniilidis. *Zur Fehlerempfindlichkeit in der Ermittlung von Objektbeschreibungen und relativen Bewegungen aus monokularen Bildfolgen (On the error sensitivity in the recovery of object descriptions and relative motions from image sequences).* Fakultät für Informatik, Universität Karlsruhe (TH), July 1992.

[259] D. Koller, K. Daniilidis, T. Thórhallson, and H. H. Nagel. Model-based object tracking in traffic scenes. In G. Sandini, editor, *Computer Vision — ECCV'92*, pages 437–452, Berlin, Heidelberg, 1992. Springer.

[260] K. Daniilidis and H.-H. Nagel. Analytical results on error sensitivity of motion estimation from two views. *Image and Vision Computing*, 8:297–303, 1990.

[261] K. Daniilidis and H.-H. Nagel. Analytical Results on Error Sensitivity of Motion Estimation from Two Views. In *Proc. First European Conference on Computer Vision*, pages 199–208. Antibes, France, Apr. 23-26, 1990.