Kostas Daniilidis
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Education

1992 PhD in Computer Science, University of Karlsruhe
Advisor: Hans-Hellmut Nagel
1989 MSE in Computer Science, University of Karlsruhe.
1986 MSE in Electrical Engineering, National Technical University of Athens.

Positions held

2003 - **Associate Professor** with tenure
1998 - 2003 **Assistant Professor**
Department of Computer and Information Science, University of Pennsylvania.
1997 Service at the Greek Army (Mechanized Infantry)
1993 - 1997 **Assistant Professor** (non-tenure-track),
Computer Science Institute, Kiel University.
1992 - 1993 **Research Associate** ,
Fraunhofer-Institute (IITB), Karlsruhe.
1989 - 1992 **Graduate Research Assistant**,
Department of Computer Science, University of Karlsruhe.
1990 - 1991 **Graduate Teaching Assistant**,
Department of Computer Science, University of Karlsruhe.

Awards

2001 Ford Motor Company Award for Best Faculty Advising in Penn Engineering.
1987 - 1992 German Academic Exchange (DAAD) Fellowship.

Research interests

My research focuses on the basic questions of space and motion perception with machines and how we can use resulting algorithms to create visually compelling immersive environments. Recently, I concentrated in the following areas:

- Geometry and signal analysis of omnidirectional vision
- Scene acquisition for tele-immersion
- Registration in mixed realities

Research Grants

Period	Agency	Title	Penn's budget
2002-2005	ARO / MURI	ACCLIMATE: Adaptive Coordinated ControL of Intelligent Multi-Agent Teams, co-PI with S. Sastry (PI), et al.	$275,000 / yr
2001-2004	NSF	ITR:Real-time long distance terascale computation for full bandwidth tele-immersion, single Penn co-PI with H. Fuchs (PI) et al.	$310,000 / yr
2001-2002	DARPA / ITO	3D-Tele-immersion for the Next Generation Internet, single Penn co-PI with H. Fuchs (PI).	$146,000 / yr
2001-2002	NSF	Advanced Surgical Training with High-Fidelity Tele-immersion, single Penn co-PI with H. Fuchs (PI), et al.	$430,988 / yr
2000-2003	NSF	Omnidirectional Vision, PI	$90,000 / yr
2000-2001	Penn Research Foundation	Adding the Sense of Touch to Tele-presence, PI	$15,000 / yr
1999-2000	Advanced Network and Services, Inc.	Scene acquisition for teleimmersion, PI	$200,000 / yr
1999-2000	Penn Research Foundation	Augmented Reality Goes Outdoors, PI	$15,000 / yr
1998-2000	ARO / MURI	Algorithmics of motion, co-PI with V. Kumar (PI) et al.	$500,000 / yr
1999-2001	DARPA / ITO	Control of Multiple Autonomous Robots, co-PI with V. Kumar (PI) et al.	$635,475 / yr
1998-1999	DARPA / TTO	Omnidirectional Vision for Surveillance, Tracking, and Navigation, co-PI with V. Kumar (PI), et al.	$450,000 / yr
1996-1998	German Science Foundation	Analysis of Infant's Face and Gaze in Image Sequences, co-PI with G. Sommer (PI)	$90,000 / yr
1995-1996	NATO	Spatiotemporal Representations for Visual Navigation, co-PI with Y. Aloimonos (PI)	$10,000 / yr

Teaching

Undergraduate Courses at the University of Pennsylvania

CSE 390 Robotics, Fall 2002.

CSE 390 Robotics, Spring 2002.

CSE 240 Introduction to Computer Architecture, Fall 2000.

CSE 240 Introduction to Computer Architecture, Fall 1999.

CSE 240 Introduction to Computer Architecture, Fall 1998.

Graduate Courses at the University of Pennsylvania

CIS 680 Advanced Topics in Machine Perception, Spring 2003.

CIS 700 Special Topics in Machine Perception, Spring 2001. of Pennsylvania.

CIS 680 Advanced Topics in Machine Perception, Spring 2000.

CIS 680 Advanced Topics in Machine Perception, Spring 1999.

Undergraduate Courses at the University of Kiel

Computer Science I, Winter 1997.

Computer Science II, Spring 1997.

Computer Science I, Winter 1996.

Image Sequence Analysis, Spring 1996.

Image Sequence Analysis, Winter 1994.

Image Sequence Analysis, Winter 1993.

Computer Vision Seminar, Spring 1993, Spring 1994, Spring 1995, 1996.

Research supervision

Postdoctoral research supervision

1. Jane Mulligan (1998-2001, now Research Assistant Professor at the University of Colorado at Boulder)
2. Thomas Buelow (2000-2002, now at Philips Research)
3. Xenophon Zampoulis (2002-).
4. Joao Pedro Barreto (2003).

Research associates' supervision

Nikhil Kelshikar, (2001-).

Graduated PhD students [1]

1. Adnan Ansar, Linear Pose Estimation, University of Pennsylvania, December 2001, since then with NASA/JPL.
2. Christopher Geyer, Catadioptric Projective Geometry, University of Pennsylvania, October 2002, since then postdoctoral researcher at UC Berkeley. Christopher Geyer won the Morris and Dorothy Rubinoff Award of the School of Engineering and Applied Science.

Graduated co-advised PhD students

1. Jeffrey Mendelsohn, Constrained Self-Calibration, University of Pennsyvania, December, 1998, co-advised with R. Bajcsy.
2. Weichuan Yu, Motion Segmentation with Steerable Filters, University of Kiel, November 2000, co-advised with G. Sommer, since May 2001 postdoctoral researcher at Yale University.

Current PhD students

1. I. Volkan Isler (1999-)
2. Rana Molana (2000-)
3. Ameesh Makadia (2001-)
4. Dinkar Gupta (2002-)

PhD Thesis Committees

1. Aaron Bloomfield, TRACE: Tactor Reach Access and Constraint Environment, expected 2003.
2. Koji Ashida, Adaptive Isosurfacing with Unorganized Oriented Points, April 2003.
3. Shih-Schon Lin, True central omnidirectional cone shaped mirror camera, April 2003.

[1] In the german academic system, only tenured faculty was eligible to supervise doctoral students before 2000.

4. Diana Xu, Incremental Algorithms for the Design of Triangular Spline-Based Surfaces, November 2002.
5. David Jelinek, Novel View Synthesis Using Quasi-Sparse Depth Maps, November 2001.
6. Geffrey Egnal, View Synthesis Using Stereo Vision and Silhouettes, June 2002.
7. Jangwoo Shin, State-Space Tool: Understanding Concurrent Programs Through State-Space, November 2001.

Masters Supervision in US

1. Oleg Naroditski (2000-2003), Spatiotemporal Orientation Simplifies 3D Reconstruction, now at Sarnoff Labs.
2. Daniel Rudoy (2001-2002), Integral Transforms on the Sphere, now at MIT Lincoln Laboratories.
3. Andrew Trister (2001-2002),, Structured Light Reconstruction, now MD/PhD student at the University of Pennsylvania.

Masters Thesis Supervision in Germany

1. T. Torhalsson, Dynamic model fitting in monocular image sequences, 1992.
2. M. Hirt, Systematic analysis of optical flow computation methods, 1993.
3. U. Garbe, Design of steerable filters in the spatiotemporal volume, 1994.
4. V. Krüger, Optical flow estimation in the complex logarithmic plane, 1995.
5. Ch. Krauss, Video-rate detection of moving objects with an active camera and implementation on a pipeline-architecture, 1996.
6. J. Ernst, Intrinsic parameter calibration of an active camera, 1996.
7. D. Buck, Projective depth representation recovery from partially calibrated stereo, 1996.
8. W. Yu, Implementation of a 3D-steerability approach for optical flow estimation, 1997.
9. S. Willemsen, Multiresolution methods for the detection and tracking of fast articulated movements in sports image sequences, 1997.

Senior Design - Independent Study - Intern Undergraduate Students

Two of my students, **Christopher Geyer**, 1999 and **Daniel Rudoy**, 2002 received the Atwater Kent Prize in Electrical Engineering, awarded each year to that member of the senior class in the Moore School who, during his or her junior and senior year has, in the opinion of the faculty of the Moore School, shown the greatest progress in judgement and in the general grasp of the broad principles of electrical engineering and development in personality and who shows the greatest promise of success in this field.

1. Christopher Geyer on Calibration of a fish-eye camera

2. David Schmid on the Real-time stereo for teleimmersion
3. Jenni Marquiss on Demonstration of catadioptric transformations
4. Bjorn Lindgren on Quicktime-VR interface for a catadioptric camera
5. Evan Witt on VRML-modelling of stereo reconstructions
6. Laura Hornbeck on Audio-based speaker localization
7. Juan Ahues on Real-time low-level image processing for tele-immersion
8. Oleg Naroditski on Tracking in omnidirectional video
9. Raj Arya on Stereoscopic Tele-immersion Displays
10. Desiree Kilburn on Modeling of Head Tracking in Immersive Environments
11. Andrew Trister on Calibration for optical head tracking for teleimmersion
12. Kalpesh Vakharia on Optotrak interface for Teleimmersion
13. Adam Lee on TCP/IP vs UDP in Tele-Immersion
14. Daniel Rudoy on Real-time Background Subtraction
15. Andrew Ganim on Calibration of Camera Clusters and Large Environment Reconstruction
16. Christi Electris on Panoramic Stereo.
17. Daniel Rudoy on Local Spherical Harmonic Representation
18. Ravi Goyal on Local Spherical Harmonic Representation
19. Vernon Balanza on Interfaces for Calibration in Archaeology
20. Theo Paulakis on Pocket-PC Omnidirectional Vision.
21. Jonathan Gouler, NSF-SUNFEST program.

International Exchange Students

1. Markus Middendorf, University of Karlsruhe, 1998.
2. Geraud de Bonnafos, Ecole Polytechnique, 2001.
3. Alexandre Chibane, Ecole Polytechnique, 2001.
4. Mark Menem, Ecole Polytechnique, 2002.
5. Cidy Sisse, Ecole Polytechnique, 2002.
6. Lorenzo Sorgi, University of Rome III, 2002.

Professional Activities

2003 - Associate Editor of the IEEE Transaction on Pattern Analysis and Machine Intelligence
2000 - 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

Guest Editorships

2003 IEEE Robotics and Automation Magazine
Special Issue on Panoramic Robotics

Tutorials

2003 3D modeling and reconstruction of dynamic visual scenes,
with S. Soatto, J, Kosecka, Y. Ma, and S. Sastry,
International Conference on Robotics and Automation
1999 Penn Undergraduate Workshop in Cogntive Science
2002 Penn Undergraduate Workshop in Cogntive Science
2000 Tutorial for Structure from Motion
with Y. Ma, C. Tomasi, CJ Taylor, S. Sastry, J. Kosecka,
International Conference on Robotics and Automation.

Program Committee Member at a Conference

2004 Int. Conf. on Pattern Recognition
2004 Area Chair at European Conf. on Computer Vision
2003 IEEE Computer Vision and Pattern Recognition Conference
2003 IEEE Int. Conf. on Advanced Video and Signal Based Surveillance
2002 IEEE Workshop on Applications of Computer Vision
2002 IEEE Int. Conf. on Image Processing
2002 Int. Symposium on Augmented and Mixed Reality
2002 Int. Conf. on Pattern Recognition
2002 European Conf. on Computer Vision
2002 Workshop on Omnidirectional Vision
2002 Vision, Modeling, and Visualization Workshop
2001 IEEE Computer Vision and Pattern Recognition Conference
2001 IEEE Int. Conf. on Image Processing
2001 Virtual and Augmented Reality in Architecture
2001 Vision, Modeling, and Visualization Workshop
2001 Int. Symposium on Augmented Reality
2000 Int. Conf. on Pattern Recognition
2000 Workshop on Large Scale Reconstruction - SMILE
2000 Int. Symposium on Augmented Reality
1999 Int. Joint Conf. on Artificial Intelligence
1998 IEEE Computer Vision and Pattern Recognition Conference
1997 Int. Conf. Comp. Analysis of Images and Patterns

1996 Int. Conf. on Pattern Recognition

Reviewer at a Conference

2002 SIGGRAPH Conference
2000 SIGGRAPH Conference

Proposal Reviewer

2000 - National Science Foundation
2001 National Institutes of Health
2002 Israel Science Foundation
1997-1999 Greek Ministry of Education

Journal Reviewer

IEEE Trans. Pattern Analysis Machine Intelligence
IEEE Trans. Robotics and Automation
IEEE Trans. Image Processing
Int. Journal of Computer Vision
Journal of the Optical Society of America
Computer Vision and Image Understanding
Neural Networks
Biological Cybernetics
Pattern Recognition Letters
Graphical Models and Image Processing
Image and Vision Computing
Robotics and Autonomous Systems
Machine Vision and Applications

Invited Presentations

Plenary talks at conferences

1. Immersive Sensing, Visualization and Visual Modeling Workshop VMV 2002, Erlangen, November 22, 2002.
2. Image Processing in the Catadioptric Plane, Third Workshop on Omnidirectional Vision, Copenhagen, June 3, 2001.
3. Omnidirectional Vision and Catadioptric Mappings, Vision Interface Conference, Ottawa, June 7, 2001.
4. Omnidirectional Vision: Theory and Algorithms, International Conference for Pattern Recognition, Barcelona, Spain, Sep. 1, 2000.

Invited talks at conferences

1. Structure from Motion from Omnidirectional Views, ICAR-Workshop on Omnidirectional Vision, Budapest, August 22, 2001.
2. Catadioptric mappings, *Workshop on shape and surface geometry, American Mathematical Society Meeting*, April 28, 2001.
3. A Unifying Theory of Imaging Systems, *Workshop on Theoretical Foundations of Computer Vision*, Schloß Dagstuhl, Mar. 18, 2000.
4. Ego-motion perception and disortion of perceptual space, Symposium Gehirn und Gestalt, Institute for Advanced Studies, Delmenhorst, June 3, 1999.
5. Attentive visual motion processing, *Workshop on Preattentive and Attentive Visual Processing, PAP*, MPI fuer biophysikalische Chemie, Göttingen, Oct. 5, 1994.
6. Issues on attentive visual motion processing, *Workshop on Theoretical Foundations of Computer Vision*, Schloss Dahstuhl, Mar. 13, 1994.
7. Modeling 3D-transformations with dual quaternions: The case of hand-eye calibration, *Workshop on Theoretical Foundations of Computer Vision*, Schloß Dagstuhl, Mar. 18, 1996.
8. Ortsvariantes Bewegungssehen, Workshop *Kognitive Robotik*, Zentrum für Kognitionswissenschaften, Universität Bremen, Mar. 2, 1995.
9. On error sensitivity of motion estimation from two views,
   The 1989 Stockholm Workshop on Computational Vision, Stockholm, Sweden, Aug. 7-10, 1989.

Colloquia and Seminars

1. Geometry and Signal Analysis Beyond the Projective Plane, Center for Automation Research, University of Maryland at College Park, February 14, 2003.
2. Signal Analysis and Geometry of Immersive Sensing, Computer Science Colloquium, Johns Hopkins University, October 24, 2002.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

17. Catadioptric Visual System, Informatics-Colloquium, Kiel University, May 28, 1999

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

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

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

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

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

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

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

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

26. 3D-motion estimation with active and space-variant systems, CVAP and Center for Autonomous Systems Seminars, KTH, Stockholm, Nov. 19, 1996

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

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

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

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

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

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

33. 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.

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

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

Publications

Refereed Journal Articles

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

[2] J. Mulligan, N. Kelshikar, X. Zabulis, and K. Daniilidis. Stereo-based Environment Scanning for Immersive Telepresence. *IEEE Trans. Circuits and Systems for Video Technology*, 2003. to appear.

[3] C. Geyer and K. Daniilidis. Omnidirectional video. *Visual Computer*, 2003. to appear.

[4] W. Yu, G. Sommer, and K. Daniilidis. Multiple Motion Analysis: in Spatial Domain or in Spectral Domain? *Computer Vision and Image Understanding*, 2003. to appear.

[5] W. Yu, G. Sommer, and K. Daniilidis. 3D-Orientation Signatures with Conic Kernel Filtering for Multiple Motion Analysis. *Image and Vision Computing*, 2003. to appear.

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

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

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

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

[10] 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.

[11] W. Yu, K. Daniilidis, G. Sommer. Approximate Orientation Steerability Based on Angular Gaussians. *IEEE Trans. Image Processing*, 10:193–205, 2001.

[12] 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.

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

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

[15] 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.

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

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

[18] K. Daniilidis. Attentive visual motion processing: computations in the log-polar plane. *Computing*, 11:1–20, 1996. Special Issue on Theoretical Foundations of Computer Vision.

[19] 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.

[20] 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.

Papers Submitted to Refereed Journals

[1] I.V. Isler, S. Kannan, and K. Daniilidis. VC-Dimension of Exterior Visibility of Polyhedra. Technical Report MS-CIS-01-34, Computer and Information Science, University of Pennsylvania, 2003. under revision IEEE Trans. Pattern Analysis Machine Intelligence.

[2] W. Yu, G. Sommer, K. Daniilidis, and J. Duncan. Skewness of gabor wavelets and its correction. *IEEE Trans. on Image Processing*, 2003. submitted.

[3] C. Geyer and K. Daniilidis. Structure and Motion from Uncalibrated Catadioptric Views. *International Journal of Computer Vision*, 2002. to be submitted.

Articles in Refereed Conferences

[1] A. Makadia and K. Daniilidis. Direct 3D-rotation estimation from spherical images via a generalized shift theorem. In *IEEE Conf. Computer Vision and Pattern Recognition*, Wisconsin, June 16-22, 2003. to appear.

[2] N. Kelshikar, X. Zampoulis, J. Mulligan, K. Daniilidis, K. Daniilidis, V. Sawant, S. Sinha, T. Sparks, S. Larsen, H. Towles, K. Mayer-Patel, H. Fuchs, J. Urbanic, K. Benninger, R. Reddy, and G. Huntoon. Stereo-based Environment Scanning for Immersive Telepresence. In *Terascale Performance Analysis Workshop*, Melbourne, Australia, June 2-4, C. Mendes et al. (Eds), Lecture Notes in Computer Science, Springer-Verlag, Berlin et al., 2003. to appear.

[3] V. Isler, S. Kannan, and K. Daniilidis. Local Exploration Algorithms: Competitive Analysis and Probabilistic Framework. In *Proc. IEEE Int. Conf. on Robotics and Automation*, Taipei, Taiwan, May 12-17, 2003.

[4] K. Daniilidis, C. Geyer, V. Isler, and A. Makadia. Omnidirectional Sensing for Robot Control. In *Control Problems in Robotics*, pp. 183–196, Workshop Proceedings, A. Bicchi, H. Christensen, D. Prattichizzo (Eds.), Springer Tracts in Advanced Robotics, 2002.

[5] 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.

[6] C. Geyer and K. Daniilidis. Properties of the Catadioptric Fundamental Matrix. In *Proc. Seventh European Conference on Computer Vision*, pp. 140–154, Copenhagen, Denmark, 2002.

[7] A. Ansar and K. Daniilidis. Linear Pose Estimation from Points or Lines. In *Proc. Seventh European Conference on Computer Vision*, pp. 282–296, Copenhagen, Denmark, 2002.

[8] C. Geyer and K. Daniilidis. Structure and motion from uncalibrated catadioptric views. In *IEEE Conf. Computer Vision and Pattern Recognition*, pp. 279–286, Hawaii, Dec. 11-13, 2001.

[9] E. Angelopoulou, R. Molana, and K. Daniilidis. Multispectral skin color modelling. In *IEEE Conf. Computer Vision and Pattern Recognition*, pp. 635–642, Hawaii, Dec. 11-13, 2001.

[10] W. Yu, G. Sommer, and K. Daniilidis. 3D-Orientation Signatures with Conic Kernel Filtering for Multiple Motion Analysis. In *IEEE Conf. Computer Vision and Pattern Recognition*, pp. 299–306, Hawaii, Dec. 11-13, 2001.

[11] W. Yu, G. Sommer, and K. Daniilidis. Skewness of Gabor Wavelets and Source Signal Separation. In *Int. Conf. Wavelet Analysis and Applications*, Hong-Kong, Dec 18-22, 2001.

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

[13] A. Ansar and K. Daniilidis. Linear Pose Estimation for Augmented Reality. In *Int. Conf. on Computer Analysis of Images and Patterns*, 2001. 101-117.

[14] J. Mulligan, V. Isler, and K. Daniilidis. Performance evaluation of stereo for tele-presence. In *Proc. Int. Conf. on Computer Vision*, Vancouver, Canada, Jul. 9-12, 2001. 558-565.

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

[16] J. Mulligan and K. Daniilidis. View-independent Scene Acquisition for Tele-Presence. In *Proc. Int. Symposium on Augmented Reality*, pp. 105–110, Munich, Germany, Oct. 5-6, 2000.

[17] J. Mulligan and K. Daniilidis. Predicting Disparity Windows for Real-time Stereo. In *Proc. Sixth European Conference on Computer Vision*, pp. 220–235, Dublin, Ireland, 2000.

[18] J. Mulligan and K. Daniilidis. Trinocular Stereo for Non-Parallel Configurations. In *Proc. Int. Conf. on Pattern Recognition*, pp. 567–570, Barcelona, Spain, Sep. 1-3, 2000.

[19] C. Geyer and K. Daniilidis. Equivalence of Catadioptric Projections and Mappings of the Sphere. In *IEEE Workshop on Omnidirectional Vision*, pp. 91–96, Hilton Head Island, June 12, 2000.

[20] C. Geyer and K. Daniilidis. A unifying theory for central panoramic systems. In *Proc. Sixth European Conference on Computer Vision*, pp. 445–462, Dublin, Ireland, 2000.

[21] C. Geyer and K. Daniilidis. Geometric Properties of Central Catadioptric Projections. In *Proc. Workshop Algebraic Frames for Perception and Action*, pp. 208–217, Kiel, Germany, Sep. 9-10, 2000.

[22] C. Geyer and K. Daniilidis. Catadioptric Camera Calibration. In *Proc. Int. Conf. on Computer Vision*, pp. 398–404, Kerkyra, Greece, Sep. 20-23, 1999.

[23] W. Yu, K. Daniilidis, G. Sommer. 3D Orientation Approximate Steerable Filter. In *DAGM Symposium on Pattern Recognition*, pp. 203–212, 2000.

[24] W. Yu, K. Daniilidis, G. Sommer. Eliminating Outliers in Motion Occlusion Analysis. In *DAGM Symposium on Pattern Recognition*, pp. 373–381, 2000.

[25] V. Kruger, R. Herpers, K. Daniilidis, and G. Sommer. Teleconferencing Using an Attentive Camera System. In *Second International Conference on Audio- and Video-Based Biometric Person Authentication*, Washington D.C., March 22-23, 1999.

[26] J. Mendelsohn and K. Daniilidis. Constrained Self-Calibration. In *IEEE Conf. Computer Vision and Pattern Recognition*, pp. 581–588, Fort Collins, CO, June 23-25, 1999.

[27] W. Yu, K. Daniilidis, S. Beauchemin, and G. Sommer. Detection and Classification of Points of Multiple Motion. In *IEEE Conf. Computer Vision and Pattern Recognition*, pp. 171–177, Fort Collins, CO, June 23-25, 1999.

[28] 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*, pp. 301–310, 1999.

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[1] C. Geyer and K. Daniilidis. Omnidirectional Visual Servoing. In *Allerton Conference in Control, Communication, and Computing*, 2002.

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Book Chapters and Editorships

[1] K. Daniilidis. Using the Algebra of Dual Quaternions for Motion Alignment. In *Geometric Algebra*, pp. 498–510. Springer-Verlag, New-York at al., 2001.

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Patents

- K. Daniilidis, E. Angelopoulou, V. Kumar, Multispectral Omnidirectional Sensor, pending.

Media Coverage

My research on tele-immersion has been featured in the following media:

Periodicals

- Scientific American (04/01),
- Pennsylvania Current (02/15/01),
- IEEE Computer (01/01),
- Computer Graphics World (01/01),
- Washington Post (11/27/00),
- New Scientist (10/21/00), and
- MIT Technology Review (8/00).

Newspapers

- Daily Pennsylvanian (01/22/01),
- Clarin (01/27/01),
- The Inquirer (01/01/01),

Web News

- Science Daily and PennNews, (11/02)
- HPCwire (01/05/01),
- PennNews (12/14/00),
- Navigator Online (11/00),

Radio Channels

- AAAS Science Update NPR (01/25/01),
- All things considered, NPR/WHYY (01/09/01),