

## **Kostas Daniilidis**

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### **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.

### **Positions held**

- 2015 - 2017 **Director of Online Programs**, Penn Engineering
- 2012 - 2016 **Associate Dean for Doctoral Education**, Penn Engineering
- 2012 - Co-Founder and Scientific Advisor of COSY Inc.
- 2009 - **Professor**, Computer and Information Science, University of Pennsylvania.
- 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.
- 1997 Service at the Greek Army (Mechanized Infantry).
- 1993 - 1997 **Assistant Professor** (non-tenure-track), Computer Science Institute, Kiel University.
- 1989 - 1992 **Graduate Research/Teaching Assistant**, Computer Science, University of Karlsruhe.

### **Honors**

- 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
- 2015 Best Paper Finalist IEEE CASE 2015
- 2012 IEEE Fellow
- 2001 Ford Motor Company Award for Best Faculty Advising in Penn Engineering.

**Google Scholar h-index = 61 as of September 2019**

## Research Grants as Penn Principal Investigator

| Period      | Agency/Industry | Title  | Penn's budget |
|-------------|-----------------|--|---------------|
| 2018 - 2021 | Honda           | Curious Minded Machines  | 900K/yr       |
| 2019        | Google          | AR/VR 3D Human Pose and Shape for AR/VR  | 150K          |
| 2019        | Amazon          | Event-based Vision   | 75K           |
| 2017 - 2020 | NSF             | RI: Medium: Collaborative Research: Closed Loop Perceptual Planning for Dynamic Locomotion                                   | 330K /3yr     |
| 2016 - 2019 | NSF             | MRI:Development of an Observatory for Quantitative Analysis of Collective Behavior in Animals PI                             | 339K/2yr      |
| 2017 - 2021 | ONR             | Active Distributed Perception PI   | 1.1M/4yr      |
| 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 Telepresence, 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  |

**As Co-principal investigator:**

| Period      | Agency     | Title   | Penn's budget  |
|-------------|------------|---|----------------|
| 2018 - 2023 | SRC-DARPA  | C-BRIC: Brain Inspired Computing; coPI with Kumar   |                |
| 2018 - 2023 | ARL        | DCIST; coPI with Kumar  |                |
| 2015 - 2018 | NSF        | Neural Bases of Song Preference and Reproductive Behavior in a Female Songbird co-PI with Schmidt                         | 800K           |
| 2013 - 2017 | ONR        | Planning and Perception for Deck Operations;co-Pi with Topcu  |                |
| 2012 - 2013 | KLA-Tencor | Accurate mapping of construction sites in progress  | \$ 54K gift    |
| 2010 - 2011 | DARPA      | Autonomous Robotic Manipulation ; co-PI with Vijay Kumar  |                |
| 2008 - 2013 | ARL        | MAST CTA Autonomous multifunctional mobile microsystems; co-PI with Vijay Kumar (PI) among 17 coPIs from six institutions | \$2,200,000/yr |

|             |       |  |               |
|-------------|-------|--|---------------|
| 2007 - 2008 | NSF   | I/UCRC Safety, Security and Rescue research Center; coPI with Vijay Kumar (PI) and U. of Minnesota coPIs   | \$70,000/yr   |
| 2007-2008   | DARPA | Object Recognition via Brain-Inspired Technology ; coPI with Taskar as PI and Shi as coPI, sub to Lockheed Martin ATL                                | \$520,000/yr  |
| 2004 - 2005 | NSF   | RR:MACNet: Mobile Ad-hoc Camera Networks; co-PI with J. Shi (PI) and V. Kumar coPI   | \$ 200,000/yr |
| 2002-2005   | ARO   | ACCLIMATE: Adaptive Coordinated Control of Intelligent Multi-Agent Teams, co-PI with V. Kumar (site PI) and S. Sastry (UC Berkeley, lead PI), et al. | \$275,000/yr  |
| 1998-2000   | ARO   | Algorithmics of motion, co-PI with V. Kumar (PI) and five more from Penn; Latombe from Stanford  | \$500,000 /yr |
| 1998-1999   | DARPA | Omnidirectional Vision for Surveillance, Tracking, and Navigation, co-PI with V. Kumar (PI), et al.  | \$450,000 /yr |

## Teaching

**Robotics Perception: with Jianbo Shi at Coursera**

**Visual Intelligence: with Jianbo Shi at EdX**

### Undergraduate Courses at the University of Pennsylvania

CSE 121 Introduction to Programming Languages, Spring 2007, Spring 2008, Fall 2008, Fall 2009, Fall 2010, Fall 2011, Fall 2012, Fall 2014

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

ESE 650 Learning in Robotics with CJJ Taylor, Spring 2019.

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

CIS 580 Machine Perception, Fall 2006, Fall 2007, Spring 2009, Spring 2010, Spring 2011, Spring 2012, Spring 2013, Fall 2013, Spring 2018, 2019.

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 2003.

CIS 700 Special Topics in Machine Perception, Spring 2001.

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

## **Research supervision**

### **Current PhD students**

1. Karl Schmeckpeper (2019-)
2. Stefanos Pertigiozoglou (2019-)
3. Bernadette Bucher (2018-)
4. Evangelos Chatzipantazis (2018-)
5. Kendall Queen (2017-)
6. Kenneth Chaney (2017-)
7. Nikolaos Kolotouros (2017-)
8. Wenxin Liu (2016-)
9. Carlos Esteves (2015-)
10. Stephen Phillips (2014-)
11. Alex Zhu (2014-)
12. George Pavlakos (2014-)

### **Graduated PhD students**

1. Adnan Ansar, 2001, NASA/JPL
2. Christopher Geyer, 2002, Berkshire Gray
3. Volkan Isler (co-advised with Kannan), 2004, faculty at University of Minnesota
4. Ameesh Makadia, 2006, Google Research
5. Nima Moshtagh, (co-advised with Jadbabaie), 2008, now with Lockheed Martin
6. Ankita Kumar, 2008, Oracle
7. Alexander Toshev (co-advised with Taskar and Shi)(2005-2010), Google Research
8. Oleg Naroditsky (2008-2012), Apple
9. Alexander Patterson (2004-2014), SightLogix
10. Mayank Bansal (2010-2014), Google X
11. Nikolay Atanasov (co-advised with George Pappas, 2010-2015), UC San Diego
12. Menglong Zhu (2011-2016), Google
13. Roy Anati (2006-2016), Google
14. Cody Phillips (2009-2016)

15. Drew Jaegle (2018, DeepMind)
16. Jason Owens (ARL)
17. Mabel Zhang (OSRF)
18. Spyros Leonardos (postdoc Penn)
19. Christine Allen-Blanchette (postdoc Princeton)
20. Monroe Kennedy III (faculty Stanford)

### **PhD Thesis Committees**

1. Armon Shariati, CIS, 2019
2. Gedas Bertasius, CIS, 2019
3. Noam Roth, Neuroscience, 2017
4. Kalin Gochev, Planning with Adaptive Dimensionality, 2016
5. Ryan Kennedy, Discrete and Continuous Optimization for Motion Estimation, 2015
6. Jeffrey Byrne, Shape Representations using Nested Descriptors, 2014
7. David Weiss, Enabling More Accurate and Efficient Structured Prediction, 2013
8. Katerina Fragkiadaki, Multi-granularity steering for human interactions: pose, motion and intention, 2013
9. Jeffrey Byrne, Shape Representations using Nested Descriptors, 2013
10. Benjamin Sapp, Human pose estimation, 2012.
11. Babak Shirmohammadi, Self-Localizing Smart Cameras, 2011
12. Elena Bernardis, Finding Dots in Microscopic Images, 2011.
13. Praveen Srinivasan, Holistic Shape-Based Object Recognition Using Bottom-up Image Structures, 2011.
14. Qihui Zhu, Shape Detection by Packing Contours and Regions, 2010.
15. Timothee Cour, Weakly Supervised Learning from Multiple Modalities: Exploiting Video, Audio and Text for Video Understanding, 2009.
16. Sujit Kuthirummal, Flexible Imaging for Capturing Depth and Controlling Field of View and Depth of Field, 2009.
17. Arvinhd Bhusnurmath, Optimization methods in computer vision, 2008.
18. Albert Montillo, Automated volumetric model construction and dynamic segmentation of the heart ventricles in tagged MRI, 2004.
19. Aaron Bloomfield, TRACE: Tactor Reach Access and Constraint Environment, 2004.

20. Koji Ashida, Adaptive Isosurfacing with Unorganized Oriented Points, April 2003.
21. Shih-Schon Lin, True central omnidirectional cone shaped mirror camera, April 2003.
22. Diana Xu, Incremental Algorithms for the Design of Triangular Spline-Based Surfaces, November 2002.
23. David Jelinek, Novel View Synthesis Using Quasi-Sparse Depth Maps, November 2001.
24. Geoffrey Egnal, View Synthesis Using Stereo Vision and Silhouettes, June 2002.
25. Jangwoo Shin, State-Space Tool: Understanding Concurrent Programs Through State-Space, November 2001.

### **Postdoctoral research supervision**

1. Marc Badger (2019-)
2. Bernd Pfrommer (2016-2018)
3. Xiaowei Zhou (2014 - 2017), Faculty at Zhejiang University
4. Roberto Tron (2013-2015), faculty at Boston University
5. Luis Puig (2013 - 2015), UW postdoc.
6. Konstantinos Derpanis (2010-2012), Ryerson University.
7. Davide Scaramuzza (2011-2012), University of Zurich.
8. Jean-Philippe Tardif (2007-2008), Researcher at NREC, Carnegie Mellon University.
9. Philippos Mordohai, co-advised with Taskar and Shi (2007-2008), now faculty at Stevens Institute of Technology.
10. Irene Cheng (2006-2008), now faculty at University of Alberta.
11. Gian-Luca Mariottini (2007), Draper Labs.
12. Rodrigo Carceroni (2005-), now at Google, Mountain View.
13. Thomas Buelow (2000-2002), now at Philips Research.
14. Xenophon Zampoulis (2002-2003), now Senior Researcher at FORTH, Greece.
15. Joao Pedro Barreto (2003), now faculty at University of Coimbra, Portugal.
16. Jane Mulligan (1998-2001), now Research Assistant Professor at the University of Colorado at Boulder.
17. Weichuan Yu, now faculty at Hong-Kong UST.

### **Visiting Scholars**

1. Luis Puig, University of Zaragoza, 2009 and 2011.

2. Yannis Pavlidis, Aristotle University of Thessaloniki, 2008.
3. Peter Hansen, CSIRO, 2008.
4. Gian-Luca Mariottini, University of Sienna, 2005.
5. Lorenzo Sorgi, University of Rome III, 2002.
6. Mark Menem, Ecole Polytechnique, 2002.
7. Cidy Sisse, Ecole Polytechnique, 2002.
8. Geraud de Bonnafos, Ecole Polytechnique, 2001.
9. Alexandre Chibane, Ecole Polytechnique, 2001.
10. Markus Middendorf, University of Karlsruhe, 1998.



## Administrative Responsibilities

- 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

## Professional Activities

|             |  |
|-------------|--|
| 2016, 2017  | ECCV Workshop Geometry meets Deep Learning   |
| 2015        | Workshop and Tutorials Chair ICCV 2015   |
| 2010        | <b>Program Cochair of ECCV 2010</b>  |
| 2008        | Short Courses Organizer for IEEE CVPR 2007   |
| 2003 - 2007 | <b>Associate Editor of the IEEE Transaction on Pattern Analysis and Machine Int</b>  |
| 2006        | with Marc Pollefeys, Conference Chair of 3rd International<br>Symposium on 3D Data Processing, Visualization, and Transmission, IEEE Press |
| 2000 - 2006 | Co-Chair of the Computer and Robot Vision TC<br>of the IEEE Robotics and Automation Society  |
| 2000        | Chair of the First IEEE Workshop on Omnidirectional Vision   |

### Guest Editorships

|      |  |
|------|--|
| 2004 | IEEE Robotics and Automation Magazine (December 2004)<br>Special Issue on Panoramic Robotics |
|------|--|

### Tutorials

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

### Area Chair at a Conference

|                   |  |
|-------------------|--|
| 2019, 2011 , 2007 | Area Chair at IEEE Int. Conf. on Computer Vision |
|-------------------|--|

2004, 2005, 2006, 2014, 2016 Area Chair at IEEE Computer Vision Pattern Recognition  
2004 Area Chair at European Conf. on Computer Vision

**Proposal or Project Reviewer**

2009 - 2014 European Commission  
2000 - National Science Foundation  
2001 National Institutes of Health  
2002, 2010 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  
Int. Journal of Robotics Research  
Journal of the Optical Society of America  
Computer Vision and Image Understanding  
Biological Cybernetics  
Pattern Recognition Letters  
Graphical Models and Image Processing  
Image and Vision Computing  
Robotics and Autonomous Systems  
Machine Vision and Applications

## Invited Presentations

### Invited talks at conferences and workshops

1. NSF Robot Learning Workshop, Lehigh University 2019
2. Plenary at the Int. Conf. on Computer Vision Systems 2019
3. ELLIS Geometric Machine Learning Workshop 2019
4. Scenes from Video Workshop 2019
5. Geometry Meets Deep Learning Workshop, ECCV 2018
6. LAIR Workshop, RSS 2018
7. Bridges to 3D Workshop, CVPR 2018
8. 3DHUMAN, CVPR 2018
9. Aerial Symposium, 2018.
10. Marconi Symposium, Oct 2, Murray Hill, 2017.
11. SIBGRAPI Conference on Graphics and Pattern Analysis, October 2017
12. Scenes from Video Workshop, Nov 1, 2017, Lake Garda
13. 3DV tutorial: 3D Shape and Pose from Single Image, Stanford U., Oct. 2016
14. 3D Shape and Pose of Object Categories, ICCV Workshop on 3D Representation and Recognition, Dec 2015
15. Seeing Glass, ICCV Workshop on 6D Pose, Dec 2015
16. Semantic Consensus, ARL Workshop on Distributed and Collaborative Intelligence, Dec 2015
17. 3D Object Recognition, Penn-Chinese Academy of Sciences Summer School, June 2015
18. 3D Shape and Pose of Object Categories, Robot Vision Conference, Nova Scotia, June 2015.
19. Active Vision Revisited, Workshop on Active Perception, ICRA 2015
20. Active Object Detection, Workshop on Active Learning, ICRA 2014
21. From appearance to geometry: Place and 3D object recognition, Workshop in honor of Professor Sommer's retirement, June 2012.
22. From appearance to geometry: Place and 3D object recognition, Workshop in honor of Professor Eklundh's 70th birthday, July 2009.
23. Pure vision based SLAM in large urban environments, ARL Vehicle Directorate Review Meeting, June 3, 2008.
24. Pure vision based SLAM in large urban environments, ARL/NSF Workshop on Future directions for visual navigation, Pasadena, May 19, 2008.

25. Pure visual metric and topological mapping, ARL CTA Colloquium, March 9, 2008
26. Visual Navigation for Humanoids, Invited presentation at the Workshop for Active Vision for Humanoids, November 29, 2007.
27. Visual registration without matching, ERCIM Spring Meetings, Memorial session for Stelios Orphanoudakis, Budapest, May 30, 2006.
28. Structure from motion without correspondence, Computer Vision and Pattern Recognition Colloquium, Technical University of Prague, April 6, 2006.
29. Localization without correspondence, Post-AC meeting, Courant Institute, NYU, Feb 27, 2006.
30. Localization as a Filtering Problem, York Symposium on Computational Vision, York University, June 18, 2005.
31. Geometry and Signal Analysis Beyond the Projective Plane, Colloquium, Technical University of Prague, January 14, 2004.
32. Navigation without correspondence, IROS Workshop on Visual Servoing, Sept. 30, 2004.
33. Visual navigation based on filtering instead of correspondences, ICRA 2004 - Workshop, Multi-robot Search and Rescue: Current Challenges and Future Directions, April 27, 2004.
34. Immersive Sensing, Visualization and Visual Modeling Workshop VMV 2002, Erlangen, November 22, 2002.
35. Structure from Motion from Omnidirectional Views, ICAR-Workshop on Omnidirectional Vision, Budapest, August 22, 2001.
36. Catadioptric mappings, *Workshop on shape and surface geometry, American Mathematical Society Meeting*, April 28, 2001.
37. A Unifying Theory of Imaging Systems, *Workshop on Theoretical Foundations of Computer Vision*, Schloß Dagstuhl, Mar. 18, 2000.
38. Ego-motion perception and distortion of perceptual space, Symposium Gehirn und Gestalt, Institute for Advanced Studies, Delmenhorst, June 3, 1999.
39. Attentive visual motion processing, *Workshop on Preattentive and Attentive Visual Processing, PAP*, MPI fuer biophysikalische Chemie, Göttingen, Oct. 5, 1994.
40. Issues on attentive visual motion processing, *Workshop on Theoretical Foundations of Computer Vision*, Schloss Dagstuhl, Mar. 13, 1994.
41. Modeling 3D-transformations with dual quaternions: The case of hand-eye calibration, *Workshop on Theoretical Foundations of Computer Vision*, Schloß Dagstuhl, Mar. 18, 1996.
42. Ortsvariantes Bewegungssehen, Workshop *Kognitive Robotik*, Zentrum für Kognitionswissenschaften, Universität Bremen, Mar. 2, 1995.
43. On the relation between instability in motion estimation and critical surfaces, *ESPRIT BRA Insight Meeting*, Nice, France, June 19-21, 1991.

44. 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-aware Representations for 3D Pose and Shape, MIT, 2019
2. Geometric Deep Learning, Brown University, 2018
3. Geometry Aware Learnt Representations, Oxford University, 2018
4. UTRC, Event-based vision, September 2018
5. SUNY Stonybrook CS Seminar, Learning 3D Geometry, March 2017
6. Niarhos Foundation Seminar Series, July 2017
7. Huawei Workshop: 3D human pose from single image
8. 3D Object and Human Pose, Linkoping University, May 2016.
9. 3D Object Recognition, Hong Kong UST Colloquium, June 2014.
10. 3D Object Shape and Pose from Single Images, UC Berkeley Vision Seminar, 2013
11. Object based localization, United Technologies Research Center, September 25, 2012.
12. 3D Object Recognition in Images and Videos, Engineering Colloquium, Lehigh University, October 17, 2011
13. 3D Object Recognition in Images and Videos, Engineering Colloquium, Harvard University, October 15, 2010
14. Shape-based recognition in point clouds, video, and single pictures, Georgia Tech RIM Colloquium, April 4, 2010.
15. Shape-based recognition in point clouds, video, and single pictures, Departmental Colloquium, Temple University, February 26, 2010.
16. 3D object recognition, CS Seminar, University of Illinois at Chicago, November 2, 2009.
17. Image Matching: Appearance, Geometry, Shape, Computer Vision Seminar, Columbia University, January 13, 2009.
18. Image Matching: Harmonic Analysis and Graph Spectral Techniques, RPI Computer Science Seminar, September 28, 2007.
19. Image Matching: Harmonic Analysis and Graph Spectral Techniques, UCLA Computer Science Colloquium, April 23, 2007.
20. Image Matching, Drexel Math Colloquium, March 20, 2007.
21. Image Matching Beyond Correspondence, Johns Hopkins Center for Imaging, February 13, 2007.

22. Visual localization and registration without matching, Institute of Computer Science, FORTH, Heraclion, Crete, May 11, 2006.
23. 3D beyond graphics, Athens Institute of Technology, April 28, 2006.
24. Localization as a Filtering Problem, University of Delaware, November 29, 2004.
25. Geometry and Signal Analysis Beyond the Projective Plane, Computer Science Department, Aristotle University of Thessaloniki, September 9, 2003.
26. Geometry and Signal Analysis Beyond the Projective Plane, Center for Automation Research, University of Maryland at College Park, February 14, 2003.
27. Signal Analysis and Geometry of Immersive Sensing, Computer Science Colloquium, Johns Hopkins University, October 24, 2002.
28. Signal Analysis and Geometry of Immersive Sensing, AI-Robotics-Vision Seminar, UC Berkeley, September 26, 2002.
29. The Geometry of Omnidirectional Views, ECE Graduate Colloquium, University of Illinois at Urbana-Champaign, September 5, 2002.
30. Multiple Omnidirectional Views, University of Washington, Graphics Seminar, February 10, 2002.
31. The Geometry of Omnidirectional Views, Columbia University, November 28, 2001.
32. Catadioptric Mappings, Stevens Institute of Technology, November 7, 2001.
33. Image Processing in the Catadioptric Plane, Third Workshop on Omnidirectional Vision, Copenhagen, June 3, 2001.
34. Omnidirectional Vision and Catadioptric Mappings, Vision Interface Conference, Ottawa, June 7, 2001.
35. Omnidirectional Vision: Theory and Algorithms, International Conference for Pattern Recognition, Barcelona, Spain, Sep. 1, 2000.
36. Omnidirectional Vision and Tele-presence, *Department of Computer Science, University of Erlangen*, October 6, 2000.
37. Omnidirectional Vision for Immersive Environments, *School of Computing, University of Utah*, July 6, 2000.
38. Omnidirectional Vision for Immersive Environments, *Center for Automation Research Seminar, University of Maryland at College Park*, May 19, 2000.
39. View-independent Scene Acquisition for Tele-immersion, *NTII-Day, Graphics Laboratory, Computer Science Department, University of North Carolina*, May 9, 2000.
40. Omnidirectional Vision for Immersive Environments, *CMU Robotics Institute Seminar*, April 21, 2000.
41. Omnidirectional Vision for Immersive Environments, *MIT AI Lab Colloquium*, April 20, 2000.

42. Catadioptric Geometry, Vision Seminar, EECS Department UC Berkeley, Aug. 16, 1999
43. Autocalibration and 3D-Reconstruction for Augmented Reality and Teleimmersion, IEEE Signal Processing Society, Philadelphia Section, June 21, 1999
44. Autocalibration and 3D-Reconstruction for Augmented Reality and Teleimmersion, Joint Heidelberg-Mannheim Vision Seminar, University of Mannheim, June 1, 1999
45. Catadioptric Visual Systems, Informatics-Colloquium, Kiel University, May 28, 1999
46. Minimally Calibrated Reconstruction for Augmented Reality, Vision Lunch Series, Computer Science Department, Yale University, Jan. 22, 1999.
47. Minimally Calibrated Reconstruction for Teleimmersion and Augmented Reality, Siemens Research Corporation, Sep. 03, 1998.
48. Dual Quaternions for Hand-Eye Calibration, Robotics Group Seminar, Computer Science Department, Stanford University, Aug. 19, 1998
49. Efficient Representations for Calibration Tasks, Robotics Seminar, EECS Department UC Berkeley, Aug. 17, 1998.
50. We move, therefore we see, Neuroinformatik-Kolloquium, Universität Ulm, Jan. 8, 1998.
51. Active visual motion analysis, Colloquium of the Computer Science Institute, FORTH, Heraklion, Crete, Jul. 22, 1997
52. Ortsvariantes aktives Bewegungssehen, Daimler-Benz, Forschungszentrum Ulm, Apr. 22, 1997.
53. We move, therefore we see, Colloquium, Department of Computer and Information Science, University of Pennsylvania, Mar. 4, 1997
54. 3D-motion estimation with active and space-variant systems, CVAP and Center for Autonomous Systems Seminars, KTH, Stockholm, Nov. 19, 1996
55. Advantages of active and space-variant sensing with respect to motion estimation, Workshop for Alternative Camera Technology ALCATECH96, Sjaellands Odde, Denmark, July 25, 1996
56. A new solution for the hand-eye calibration problem, INRIA Rocquencourt, June 28, 1996.
57. Neuere Entwicklungen in der Berechnung der 3D-Bewegung aus monokularen Bildfolgen, Fachbereich Mathematik und Informatik der Friedrich-Schiller-Universität Jena, May 15, 1996
58. Berechnung des optischen Flusses und der 3D-Bewegung in der komplex-logarithmischen Ebene, Freitagskolloquium, Max-Planck Instituts für Biologische Kybernetik, June 9, 1995.
59. Motion computations on the log-polar plane, *Computer Science Colloquium*, Computer and Information Science Department, University of Pennsylvania, Oct. 25, 1994.
60. Motion computations on the log-polar plane, *Computer Vision Laboratory Seminar*, University of Maryland at College Park, Oct. 21, 1994.

61. 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.
62. Three-dimensional motion estimation from monocular image sequences,  
*Colloquium of the Research Institute for Applied Knowledge Based Systems (FAW)*, Ulm,  
Germany, Dec. 17, 1992.



## References

- [1] 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.
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