



12th Workshop "Theoretical Foundations of Computer Vision" - June 2004

## **Imaging Beyond the Pinhole Camera**

Schloß Dagstuhl. Wadern, Germany

June 13 – June 18, 2004

### **Chairmen**

**Kostas Daniilidis** (USA), **Reinhard Klette** (New Zealand)

**Ales Leonardis** (Slovenia)

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### **Monday morning**

- 09.00      **Opening:** Reinhard Klette
- 09:10 - 12      **SESSION 1: Sensor Design**  
                    chair: Reinhard Koch
- 09:10-09:40      Elli Angelopoulou: Beyond Tri-chromatic Imaging
- 09:40-10:10      Rahul Swaminathan: Beyond Perspective Imaging Systems –  
                            Geometry and Design
- 10:10-10:30      BREAK
- 10:30-11:00      Robert Pless: Extreme Non-Central Camera Geometries
- 11:00-11:30      Helder Araujo: 3D Reconstruction and Motion Estimation for  
                            Non-Central Catadioptric Cameras
- 11:30-12:00      Takashi Matsuyama: Ubiquitous and Wearable Vision Systems

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### **Monday afternoon**

- 13:30 – 15:30      **Personal Introductions and Discussion on Challenges on  
Sensors and Vision**  
                            chairs: Kostas Daniilidis and Ales Leonardis

## Monday late afternoon

- 16 - 18      **SESSION 2: Vision for Robots and Doctors**  
chair: Peter Sturm
- 16:00-16:30      Felix von Hundelshausen: A Constructive Feature Detection Approach for Robotic Vision
- 16:30-17:00      John Barron: 3D Optical Flow in Gated MRI Cardiac Rate
- 17:00-17:30      Paul Whelan: Computer Aided Diagnosis for Whole Body MRI

## Tuesday morning

- 9 - -12      **SESSION 3: Geometry**  
chair: Hans-Hellmut Nagel
- 09:00-09:40      Peter Sturm: A Generic Concept for Camera Calibration (Applicable to Central or Non-central Cameras)
- 09:40-10:10      Rene Vidal: Reconstruction of Dynamic Scenes
- 10:10-10:30      BREAK
- 10:30-11:00      Reinhard Klette: Stereo Imaging with Rotating Line Cameras
- 11:00-11:30      Joao Barreto: Unifying ...
- 11:30-12:00      Akihiko Torii: Geometry of A Class of Catadioptric Camera Systems

## Tuesday afternoon

- 13:30-15:00      Fieldwork with omnidirectional cameras

## Tuesday late afternoon

- 16 - 18      **SESSION 4: Image Based Rendering I**  
chair: Atsushi Imiya
- 16:00-16:30      Smuel Peleg: Time Warping for Image-Based Rendering
- 16:30-17:00      Hynek Bakstein: Image Based Rendering using Omnidirectional X-Slits Images
- 17:00-17:30      Ralf Reulke: Moving Panoramic Mapping using CCD-Line

Camera and Laser Scanner  
17:30-18:00 Hideo Saito: 4D Modeling and Rendering from Multiple  
View Cameras

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**Tuesday evening after dinner**

19:30-21:00 **Wild Session**  
chair: Reinhard Klette

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**Wednesday morning**

9 - 12 **SESSION 5: Image Based Rendering II**

chair: Hideo Saito

09:00-09:40 Reinhard Koch: Structure and Pose Estimation with a  
Multi-Camera System

09:40-10:10 Atsushi Imiya: Motion Analysis on the Curved Retina

10:10-10:30 BREAK

10:30-11:00 Andreas Koschan: Multi-perspective Mosaics for Inspection  
and Visualization

11:00-11:30 Karsten Scheibe: Fusion of Panoramic Images and Range  
Finder Scans

11:30-12:00 Ryad Benosman: Geometric Construction of the Caustic  
Surface for Catadioptric Noncentral Sensors

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**Wednesday afternoon / evening**

13:00 Group photo (stairs to chapel)

13:05-21:30 Bus tour (boat cruise on Saar river, visit of Villeroy & Boch,  
visit of a vineyard with wine tasting and dinner)

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**Thursday morning**

9-12 **SESSION 6: Signal Analysis and Motion Estimation**

chair: Peter Sturm

09:00-09:35 Matthias Conrad: Multiresolution on the Sphere

09:35-10:00 Juergen Prestin: Quadrature Formulas on the Sphere

09:50-10:30 Ameesh Makadia: Motion Estimation on the Sphere

- 10:30-10:45 BREAK  
10:45-11:20 Christopher Geyer: Euclid meets Fourier,  
11:20-12:00 Jan Neumann: Polydioptric Motion Estimation

**Thursday afternoon**

- 13:30-14:00 Sanjiv Singh: Motion from Motion: The Search for Invariance  
14:00-15:00 Kostas Daniilides and Christopher Geyer: Tutorial on geometry and  
signal analysis for omnidirectional cameras

**Thursday late afternoon**

- 16-18 **SESSION 7: Visual navigation**  
chair: Sanjiv Singh  
16:00-16:30 Sven Behnke: Omnidirectional Vision for Soccer Playing Robots  
16:30-17:00 Mohamed Kotb: Reliable Motion Estimation for Navigation  
17:00-17:30 Matjas Jogan: Appearance-based Localization  
17:30-18:00 Antonis Argyros: Centering and Homing Behaviors for Mobile  
Robots with Panoramic Cameras

**Thursday evening after dinner**

- 19:30 Ryad Benosman, Karsten Scheibe and Kostas Daniilidis:  
History of panoramic techniques (and patents)

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**Friday morning**

- 9-12 **SESSION 8: TBA**  
chair: Shmuel Peleg  
09:00-09:30 Doron Feldman: Generating Mosaics with Minimum Distortions  
09:30-10:00 Kostas Daniilidis: The Structure of Central and non-Central Essential  
Manifolds  
10:00-10:30 BREAK  
10:40-12:00 Presentation of Experiments and Round-table Discussion