

# Sanjeev J. Koppal

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*Objective*      To create cutting edge work in computer vision and computational photography

*Areas of Expertise*      Computational sensors, Novel cameras and lighting, Physics-based vision, Digital cinematography, 3D cinema, Active illumination, Image-based and Light-field rendering, Appearance modeling, 3D reconstruction

*Education*

- Carnegie Mellon University, Robotics Institute  
PhD in **Robotics**, August 2009, GPA: 3.79
- Carnegie Mellon University, Robotics Institute  
Masters in **Robotics**, May 2006, GPA: 3.79
- University of Southern California  
Bachelors in **Computer Science**, May 2003, GPA: 3.93

*Skills*

- C/C++/VC++, Matlab, Mathematica, CorelDraw, Premiere, Windows, UNIX/Linux

*Refereed Conference Papers*

- Wide-angle micro sensors for vision on a tight budget  
Conference on Computer Vision and Pattern Recognition, 2011.  
**S. J. Koppal**, I. Gkioulekas, T. Zickler and G. Barrows  
(Oral Presentation, 4% acceptance rate)
- Shadow cameras: Reciprocal views from illumination masks  
International Conference on Computer Vision, 2009.  
**S. J. Koppal** and S. G. Narasimhan  
(Poster Presentation, 20% acceptance rate)  
[http://www.cs.cmu.edu/~ILIM/projects/IM/shadow\\_cameras.html](http://www.cs.cmu.edu/~ILIM/projects/IM/shadow_cameras.html)
- Temporal dithering of illumination for fast active vision  
European Conference on Computer Vision, 2008.  
S. G. Narasimhan, **S. J. Koppal** and S. Yamazaki  
(Oral Presentation, 4% acceptance rate)  
<http://www.cs.cmu.edu/~ILIM/projects/IL/dlp-dithering/>
- Novel depth cues from uncalibrated near-field lighting  
International Conference on Computer Vision, 2007.  
**S. J. Koppal** and S. G. Narasimhan  
(Poster Presentation, 20% acceptance rate)  
[http://www.cs.cmu.edu/~ILIM/projects/AA/depth\\_cues.html](http://www.cs.cmu.edu/~ILIM/projects/AA/depth_cues.html)
- Clustering appearance for scene analysis  
Conference on Computer Vision and Pattern Recognition, 2006.  
**S. J. Koppal** and S. G. Narasimhan  
(Oral Presentation, 4% acceptance rate)  
<http://www.cs.cmu.edu/~ILIM/projects/AA/clustering.html>

- Structured light from scattering media  
International Conference on Computer Vision, 2005.  
S. G. Narasimhan, S. K. Nayar, B. Sun and **S. J. Koppal**  
(Oral Presentation, 4% acceptance rate)  
<http://www.cs.cmu.edu/~ILIM/projects/LT/structured/structured.html>

#### *Journals*

- Appearance derivatives for iso-normal clustering of scenes  
**S. J. Koppal** and S. G. Narasimhan  
Transactions on Pattern Analysis and Machine Intelligence, 2008.
- A viewer-centric editor for stereoscopic cinema  
**S. J. Koppal**, L. Zitnick, M. Cohen, S. Kang, B. Ressler and A. Colburn  
IEEE Computer Graphics and Applications, 2011
- Exploiting DLP illumination dithering for reconstruction and photography of high-speed scenes  
**S. J. Koppal**, S. Yamazaki and S. G. Narasimhan  
International Journal on Computer Vision, 2011

#### *Workshop papers and Technical reports*

- Illustrating motion through DLP Photography  
PROCAMS 2009  
**S. J. Koppal** and S. G. Narasimhan
- Taylor Series of Appearance Functions  
CMU-Robotics Institute Technical report, 2006  
**S. J. Koppal**, A. Datta, S. G. Narasimhan and K. Nishino

#### *Work Experience*

- Research Associate, (2009-present)  
Harvard University  
Mentor: Prof. Todd Zickler
- Graduate Research Assistant, (2003-2009)  
Robotics Institute, Carnegie Mellon University  
Advisor: Prof. Srinivasa Narasimhan
- Consultant, (October-November 2008)  
Microsoft Research, Interactive Visual Media Group  
Mentors: Dr. Sing Bing Kang, Dr. Larry Zitnick and Dr. Michael Cohen
  - Created a mathematical framework for a stereoscopic editing tool
  - Performed user studies to evaluate the tool
- Research Intern, (summer 2008)  
Microsoft Research, Interactive Visual Media Group  
Mentors: Dr. Sing Bing Kang, Dr. Larry Zitnick and Dr. Michael Cohen
  - Designed an interactive stereoscopic editing tool
  - Wrote preprocessing software to rectify and interlace stereoscopic content
- Software Design Engineer Intern, (summer 2002)  
Microsoft Corporation

- Software Engineer Intern, (summer 2001)  
Disappearing, Inc.
  - Worked on Disappearing, Inc. secure email server
- Programmer and Undergraduate Researcher, (1999 to 2003)  
Robotics Embedded Systems Lab, University of Southern California  
Advisor: Prof. Gaurav Sukhatme

- Patents*
- Pending U.S. Patent Application with Microsoft Research  
(L. Zitnick, M.Cohen, S. Kang and B. Ressler)
  - Pending U.S. Patent Application on Micro Optical Sensors  
(G. Barrows, I. Gkioulekas, T. Zickler)

- Courses*
- Computer vision
  - Computer graphics
  - Vision sensors
  - Image and video processing
  - Physics-based vision
  - Machine learning
  - Geometry-based vision
  - Optics

- Teaching*
- Graduate Computer Vision (Teaching Assistant)  
Instructor: Prof. Martial Hebert
  - Vision Sensors (Teaching Assistant)  
Instructor: Prof. Srinivasa Narasimhan

- Awards*
- USC Computer Science Award for Outstanding Achievement (2003)
  - University of Southern California Trustee Scholarship (full tuition) (1999-2003)
  - USC Undergraduate Engineering Research Award (1999-2003)

- Professional Activities*
- Reviewed conference papers (SIGGRAPH, CVPR and ICCV) and journal papers (IJCV)
  - Committee member for Uland Wong, Mohit Gupta, Ayorkor Mills-Tettey and Peter Barnum

- Leadership*
- President, Pittsburgh Chapter, Association for India's Development (AID), 2005-06
  - RI Representative at Graduate Student Assembly and Roboorg, 2004-06

- Additional information*
- Website: <http://www.koppal.com/>
  - Languages: English, Hindi, Kannada
  - Citizenship: India

- References*
- Available on request for:
    - Prof. Srinivasa Narasimhan
    - Dr. Michael Cohen
    - Dr. Larry Zitnick
    - Prof. Martial Hebert
    - Dr. Sing Bing Kang
    - Prof. Todd Zickler