

Niloy J. Mitra

Senior Lecturer
University College London
Department of Computer Science,
MPEB Room 6.17,
Gower Street,
London, UK WC1E 6BT.

Phone: +44 (0)20 7679 0322
Fax: +44 (0)20 7387 1397
Email: n.mitra@cs.ucl.ac.uk
Homepage: <http://www.cs.ucl.ac.uk/staff/n.mitra/>

1 Education

Ph.D. Electrical Engineering, Stanford University, 2006 (advisor: Prof. Leo Guibas)

M.S. Electrical Engineering, Stanford University, 2002

B.S. Electronics and Communication Engineering, IIT Kharagpur, 1999 (advisor: Prof. Prabir Biswas)

2 Employment

Senior Lecturer, University College London, 2011-present

Associate Professor, KAUST, 2011 (on leave)

Guest Professor, TU Vienna, 2009–2011

Assistant Professor, KAUST, 2009–2011

Assistant Professor, IIT Delhi, 2007–2009

Postdoctoral Scholar, TU Vienna, 2006–2007 (mentor: Prof. Helmut Pottmann)

3 Publications

3.1 Refereed Journals

[Aiger et al.(2012)Aiger, Cohen-Or, and Mitra] Aiger, D., Cohen-Or, D., and Mitra, N.J. (2012). Repetition maximization based texture rectification. *Computer Graphics Forum (EUROGRAPHICS)*.

[Ceylan et al.(2012)Ceylan, Mitra, Li, Weise, and Pauly] Ceylan, D., Mitra, N.J., Li, H., Weise, T., and Pauly, M. (2012). Factored facade acquisition using symmetric line arrangements. *Computer Graphics Forum (EUROGRAPHICS)*.

[Kim et al.(2012)Kim, Li, Mitra, DiVerdi, and Funkhouser] Kim, V.G., Li, W., Mitra, N.J., DiVerdi, S., and Funkhouser, T. (2012). Exploring collections of 3d models using fuzzy correspondences. *ACM Transactions on Graphics (Proc. SIGGRAPH)*, 31(4).

[Mitra et al.(2012)Mitra, Pauly, Wand, and Ceylan] Mitra, N.J., Pauly, M., Wand, M., and Ceylan, D. (2012). Symmetry in 3d geometry: Extraction and applications. *State-of-the-art Report (STAR) EUROGRAPHICS*.

- [Umetani et al.(2012)Umetani, Igarashi, and Mitra] Umetani, N., Igarashi, T., and Mitra, N.J. (2012). Guided exploration of physically valid shapes for furniture design. *ACM Transactions on Graphics (Proc. SIGGRAPH)*, 31(4).
- [Zheng et al.(2012)Zheng, Chen, Cheng, Zhou, Hu, and Mitra] Zheng, Y., Chen, X., Cheng, M.M., Zhou, K., Hu, S.M., and Mitra, N.J. (2012). Interactive images: Proxy-based scene understanding for smart manipulation. *ACM Transactions on Graphics (Proc. SIGGRAPH)*, 31(4).
- [Berner et al.(2011)Berner, Wand, Mitra, Mewes, and Seidel] Berner, A., Wand, M., Mitra, N.J., Mewes, D., and Seidel, H.P. (2011). Shape analysis with subspace symmetries. *Computer Graphics Forum (EUROGRAPHICS)*, 30(2).
- [Fu et al.(2011)Fu, Zhjou, Liu, and Mitra] Fu, H., Zhjou, S., Liu, L., and Mitra, N. (2011). Animated construction of line drawings. *ACM Transactions on Graphics (Proc. SIGGRAPH Asia)*, 30(6).
- [Li et al.(2011)Li, Wu, Chrysanthou, Sharf, Cohen-Or, and Mitra] Li, Y., Wu, X., Chrysanthou, Y., Sharf, A., Cohen-Or, D., and Mitra, N.J. (2011). Globfit: Consistently fitting primitives by discovering global relations. *ACM Transactions on Graphics (Proc. SIGGRAPH)*, 30(4).
- [McCrae et al.(2011)McCrae, Singh, and Mitra] McCrae, J., Singh, K., and Mitra, N.J. (2011). Slices: A shape-proxy based on planar sections. *ACM Transactions on Graphics (Proc. SIGGRAPH Asia)*, 30(6).
- [Ovsjanikov et al.(2011)Ovsjanikov, Li, Guibas, and Mitra] Ovsjanikov, M., Li, W., Guibas, L., and Mitra, N.J. (2011). Exploration of continuous variability in collections of 3d shapes. *ACM Transactions on Graphics (Proc. SIGGRAPH)*, 30(4).
- [Yang et al.(2011)Yang, Yang, Pottmann, and Mitra] Yang, Y.L., Yang, Y.J., Pottmann, H., and Mitra, N.J. (2011). Shape space exploration of constrained meshes. *ACM Transactions on Graphics (Proc. SIGGRAPH Asia)*, 30(6).
- [Cheng et al.(2010)Cheng, Zhang, Mitra, Huang, and Hu] Cheng, M.M., Zhang, F.L., Mitra, N.J., Huang, X., and Hu, S.M. (2010). Repfinder: Finding approximately repeated scene elements for image editing. *ACM Transactions on Graphics (Proc. SIGGRAPH)*, 29(4).
- [Chu et al.(2010)Chu, Hsu, Mitra, Cohen-Or, Wong, and Lee] Chu, H.K., Hsu, W.H., Mitra, N.J., Cohen-Or, D., Wong, T.T., and Lee, T.Y. (2010). Camouflage images. *ACM Transactions on Graphics (Proc. SIGGRAPH)*, 29(3).
- [Eigensatz et al.(2010)Eigensatz, Kilian, Schiftner, Mitra, Pottmann, and Pauly] Eigensatz, M., Kilian, M., Schiftner, A., Mitra, N.J., Pottmann, H., and Pauly, M. (2010). Paneling architectural freeform surfaces. *ACM Transactions on Graphics (Proc. SIGGRAPH)*, 29(4).
- [Karpenko et al.(2010)Karpenko, Li, Mitra, and Agrawala] Karpenko, O., Li, W., Mitra, N., and Agrawala, M. (2010). Exploded view diagrams of mathematical surfaces. *IEEE Transactions on Visualization and Computer Graphics*, 16:1311–1318.
- [Li et al.(2010)Li, Liu, Zheng, and Mitra] Li, G., Liu, L., Zheng, H., and Mitra, N.J. (2010). Analysis, reconstruction and manipulation using arterial snakes. *ACM Transactions on Graphics (Proc. SIGGRAPH Asia)*, 29(5).
- [Mehra et al.(2010)Mehra, Tripathi, Sheffer, and Mitra] Mehra, R., Tripathi, P., Sheffer, A., and Mitra, N.J. (2010). Visibility of noisy point cloud data. *Computers and Graphics*.
- [Mitra et al.(2010)Mitra, Yang, Yan, Li, and Agrawala] Mitra, N.J., Yang, Y.L., Yan, D.M., Li, W., and Agrawala, M. (2010). Illustrating how mechanical assemblies work. *ACM Transactions on Graphics (Proc. SIGGRAPH)*, 29(3).

- [Zheng et al.(2010)Zheng, Sharf, Wan, Li, Mitra, Cohen-Or, and Chen] Zheng, Q., Sharf, A., Wan, G., Li, Y., Mitra, N.J., Cohen-Or, D., and Chen, B. (2010). Non-local scan consolidation for 3d urban scenes. *ACM Transactions on Graphics (Proc. SIGGRAPH)*, 29(4).
- [Gal et al.(2009)Gal, Sorkine, Mitra, and Cohen-Or] Gal, R., Sorkine, O., Mitra, N.J., and Cohen-Or, D. (2009). iwires: An analyze-and-edit approach to shape manipulation. *ACM Transactions on Graphics (Proc. SIGGRAPH)*, 28(3):#33, 1–10.
- [Mehra et al.(2009)Mehra, Zhou, Long, Sheffer, Gooch, and Mitra] Mehra, R., Zhou, Q., Long, J., Sheffer, A., Gooch, A., and Mitra, N.J. (2009). Abstraction of man-made shapes. *ACM Transactions on Graphics (Proc. SIGGRAPH Asia)*, 28(5):#137, 1–10.
- [Mitra et al.(2009)Mitra, Chu, Lee, Wolf, Yeshurun, and Cohen-Or] Mitra, N.J., Chu, H.K., Lee, T.Y., Wolf, L., Yeshurun, H., and Cohen-Or, D. (2009). Emerging images. *ACM Transactions on Graphics (Proc. SIGGRAPH Asia)*, 28(5).
- [Mitra and Pauly(2009)] Mitra, N.J. and Pauly, M. (2009). Shadow art. *ACM Transactions on Graphics (Proc. SIGGRAPH Asia)*, 28(5).
- [Aiger et al.(2008)Aiger, Mitra, and Cohen-Or] Aiger, D., Mitra, N.J., and Cohen-Or, D. (2008). 4-points congruent sets for robust surface registration. *ACM Transactions on Graphics (Proc. SIGGRAPH)*, 27(3):#85, 1–10.
- [Kilian et al.(2008)Kilian, Flöry, Chen, Mitra, Sheffer, and Pottmann] Kilian, M., Flöry, S., Chen, Z., Mitra, N.J., Sheffer, A., and Pottmann, H. (2008). Curved folding. *ACM Transactions on Graphics (Proc. SIGGRAPH)*, 27(3):#75, 1–9.
- [Pauly et al.(2008)Pauly, Mitra, Wallner, Pottmann, and Guibas] Pauly, M., Mitra, N.J., Wallner, J., Pottmann, H., and Guibas, L. (2008). Discovering structural regularity in 3D geometry. *ACM Transactions on Graphics (Proc. SIGGRAPH)*, 27(3):#43, 1–11.
- [Pottmann et al.(2008)Pottmann, Grohs, and Mitra] Pottmann, H., Grohs, P., and Mitra, N.J. (2008). Laguerre minimal surfaces, isotropic geometry and linear elasticity. *Journal of Computational and Applied Mathematics*.
- [Kilian et al.(2007)Kilian, Mitra, and Pottmann] Kilian, M., Mitra, N.J., and Pottmann, H. (2007). Geometric modeling in shape space. *ACM Transactions on Graphics (Proc. SIGGRAPH)*, 26(3):#64, 1–8.
- [Mitra et al.(2007)Mitra, Guibas, and Pauly] Mitra, N.J., Guibas, L., and Pauly, M. (2007). Symmetrization. *ACM Transactions on Graphics (Proc. SIGGRAPH)*, 26(3):#63, 1–8.
- [Mitra et al.(2006)Mitra, Guibas, and Pauly] Mitra, N.J., Guibas, L., and Pauly, M. (2006). Partial and approximate symmetry detection for 3d geometry. *ACM Transactions on Graphics (Proc. SIGGRAPH)*, 25(3):560–568.
- [Mitra et al.(2004)Mitra, Nguyen, and Guibas] Mitra, N.J., Nguyen, A., and Guibas, L. (2004). Estimating surface normals in noisy point cloud data. *special issue of International Journal of Computational Geometry and Applications*, 14(4–5):261–276.

3.2 Refereed Conferences

- [Alsisan and Mitra(2012)] Alsisan, S. and Mitra, N.J. (2012). Variation-factored encoding of facade images. In *EUROGRAPHICS Short Paper*.

- [Cheng et al.(2011)Cheng, Zhang, Mitra, Huang, and Hu] Cheng, M.M., Zhang, G.X., Mitra, N.J., Huang, X., and Hu, S.M. (2011). Global contrast based salient region detection. In *CVPR*.
- [Li et al.(2011)Li, Zheng, Sharf, Cohen-Or, Chen, and Mitra] Li, Y., Zheng, Q., Sharf, A., Cohen-Or, D., Chen, B., and Mitra, N.J. (2011). 2d-3d fusion for layer decomposition of urban facades. In *ICCV*.
- [Eigensatz et al.(2010)Eigensatz, Deuss, Schiffner, Kilian, Mitra, Pottmann, and Pauly] Eigensatz, M., Deuss, M., Schiffner, A., Kilian, M., Mitra, N.J., Pottmann, H., and Pauly, M. (2010). Case studies in cost-optimized paneling of architectural freeform surfaces. In *Advances in Architectural Geometry*.
- [Mitra et al.(2010)Mitra, Bronstein, and Bronstein] Mitra, N.J., Bronstein, A., and Bronstein, M. (2010). Intrinsic regularity detection in 3d geometry. In *ECCV*.
- [Kilian et al.(2008)Kilian, Flöry, Chen, Mitra, Sheffer, and Pottmann] Kilian, M., Flöry, S., Chen, Z., Mitra, N.J., Sheffer, A., and Pottmann, H. (2008). Developable surfaces with curved creases. In *Advances in Architectural Geometry*, pp. 33–36.
- [Mitra and Pauly(2008)] Mitra, N.J. and Pauly, M. (2008). Symmetry for architectural design. In *Advances in Architectural Geometry*, pp. 13–16.
- [Sawant and Mitra(2008)] Sawant, N. and Mitra, N.J. (2008). Color harmonization for videos. In *Indian Conference on Computer Vision, Graphics and Image Processing*.
- [Mitra et al.(2007)Mitra, Flory, Ovsjanikov, Gelfand, Guibas, and Pottmann] Mitra, N.J., Flory, S., Ovsjanikov, M., Gelfand, N., Guibas, L., and Pottmann, H. (2007). Dynamic geometry registration. In *Symposium on Geometry Processing*, pp. 173–182.
- [Mitra et al.(2006)Mitra, Guibas, Giesen, and Pauly] Mitra, N.J., Guibas, L., Giesen, J., and Pauly, M. (2006). Probabilistic fingerprints for shapes. In *Symposium on Geometry Processing*, pp. 121–130.
- [Gelfand et al.(2005)Gelfand, Mitra, Guibas, and Pottmann] Gelfand, N., Mitra, N.J., Guibas, L.J., and Pottmann, H. (2005). Robust global registration. In *Symposium on Geometry Processing*, pp. 197–206.
- [Pauly et al.(2005)Pauly, Mitra, Giesen, Gross, and Guibas] Pauly, M., Mitra, N.J., Giesen, J., Gross, M., and Guibas, L. (2005). Example-based 3d scan completion. In *Symposium on Geometry Processing*, pp. 23–32.
- [Mitra et al.(2004)Mitra, Gelfand, Pottmann, and Guibas] Mitra, N.J., Gelfand, N., Pottmann, H., and Guibas, L. (2004). Registration of point cloud data from a geometric optimization perspective. In *Symposium on Geometry Processing*, pp. 23–31.
- [Pauly et al.(2004)Pauly, Mitra, and Guibas] Pauly, M., Mitra, N.J., and Guibas, L. (2004). Uncertainty and variability in point cloud surface data. In *Symposium on Point-Based Graphics*, pp. 77–84.
- [Mitra and Nguyen(2003)] Mitra, N.J. and Nguyen, A. (2003). Estimating surface normals in noisy point cloud data. In *Proceedings of the nineteenth annual symposium on Computational geometry*, pp. 322–328.
- [Mitra and Gupta(2002)] Mitra, N.J. and Gupta, M. (2002). A two-stage color palettization algorithm for error diffusion. In *SPIE Electronic Imaging Conference*, pp. 207–217.
- [Mitra et al.(2000)Mitra, Biswas, and Acharya] Mitra, N.J., Biswas, P.K., and Acharya, T. (2000). Modified embedded zerotree scheme for efficient coding of discrete wavelet coded frames. In *Indian Conference on Computer Vision, Graphics and Image Processing*.

3.3 *Invited Articles*

N. J. Mitra. 3D Geometry Processing: From Acquisition to Shape Analysis, FIIT Forum, volume 15, no. 2, July 2009.

N. J. Mitra, Introductory graphics, revisited (book review), Computer-Aided Design, Volume 41, Issue 11, 2009.

3.4 *International Patents*

[Mitra and Pauly(2009)] Mitra, N.J. and Pauly, M. (2009). Shadow art. European Patent application EP 09 014870.

[Mitra et al.(2008)Mitra, Guibas, and Pauly] Mitra, N.J., Guibas, L., and Pauly, M. (2008). System and methods for enhancing symmetry in 2d and 3d objects. US Patent 20100066760.

[Acharya et al.(2006a)Acharya, Biswas, and Mitra] Acharya, T., Biswas, P.K., and Mitra, N.J. (2006). Wavelet zerotree image coding of ordered bits. US Patent 7050640.

[Acharya et al.(2006b)Acharya, Biswas, and Mitra] Acharya, T., Biswas, P.K., and Mitra, N.J. (2006). Wavelet coding of video. US Patent 7020206.

[Acharya et al.(2006c)Acharya, Mitra, and Biswas] Acharya, T., Mitra, N.J., and Biswas, P.K. (2006). Wavelet zerotree coding of ordered bits. US Patent 7065253.

[Acharya et al.(2006d)Acharya, Mitra, and Biswas] Acharya, T., Mitra, N.J., and Biswas, P.K. (2006). Method of compressing a color image. US Patent 6798901.

4 Professional Activities

Program Chair

2012: Symposium on Geometry Processing (SGP)

2011: Shape Modeling International (SMI)

Associate Editor

Computers & Graphics

Visual Computer

Program Committees

SIGGRAPH 2011, 2012

SIGGRAPH Asia 2009, 2010

EUROGRAPHICS 2012

Symposium on Geometry Processing (SGP) 2008–2011

ECCV 2012

ICCV 2011

ACCV 2010

CVPR workshop 2012

NORDIA 2009 – 2011

Pacific Graphics 2009 – 2011

SIAM/SCM Geometric and Physical Modeling 2009, 2011

Advances in Architectural Geometry 2008, 2010, 2012

4.1 *PhD Examinations (external)*

TU Vienna, September 2011

INRIA Sophia-Antipolis, December 2009

4.2 *Funding*

July 2012 – June 2015: Marie Curie Career Integration Grant 303541

Dec. 2011: Adobe Research Award

July 2010 – July 2011: KAUST-Stanford AEA grant on digital restoration

May 2009 – July 2011: baseline research fund

Sept. 2007: IIT Delhi startup funding

4.3 *Keynote Talks*

Inspiration from Nature: Digital Exploration of Materials, Structure, and Form in Architecture, Harvard University, 2011

Trends in Mathematical Imaging and Surface Processing, Oberwolfach 2011

Pacific Graphics, Hangzhou, 2010

Curves and Surfaces, Avignon, 2010

NORDIA in conjunction with ICCV, Kyoto 2009

4.4 *Invited Talks*

08/03/2012, Cardiff University, UK

03/03/2011, Indian Statistical Institute, India

02/02/2011, Oberwolfach, Germany

10/12/2010, TU Graz, Austria

25/10/2010 Carnegie Mellon University, Qatar, 2010

15/06/2010 Summer Research Institute, EPFL, Lausanne

21/05/2010 Computer Graphics Institute, TU Vienna

31/03/2010 Department of Computer Science, Stanford University, CA

29/03/2010 Graphics Laboratory, University of California, Berkeley

27/09/2009 keynote NORDIA in conjunction with ICCV 2009, Kyoto, Japan

30/07/2009 Graphics Laboratory, Stanford University, CA
04/07/2009 Adobe, Delhi, India
16/06/2009 University of Hong Kong
18/06/2009 Tsinghua University, China
23/01/2009 BITS, Pilani, India
01/11/2008 Indian Institute of Technology, Kharagpur
08/07/2008 Graphics Laboratory, Stanford University, CA
04/21/2008 TCS Workshop on Virtual Reality and its Appl. to Enterprises, New Delhi, India
02/5/2007 Indo-Israel Workshop on Computer Vision, Hyderabad, India
09/15/2007 Workshop on Polyhedral Surfaces and Industrial Applications, Strobl, Austria
08/03/2007 Google TechTalk, Mountain View, CA
06/29/2007 University of Tübingen
04/26/2007 Indian Institute of Technology, Kanpur
04/25/2007 Indian Institute of Technology, Delhi
04/24/2007 Indian Institute of Science, Bangalore
04/23/2007 Indian Institute of Technology, Mumbai
22/03/2007 FSP Industrial Geometry workshop, Graz
02/12/2007 Indian Institute of Technology, Kharagpur
05/08/2006 DARPA Topological Data Analysis Program Annual Meeting, Santa Barbara, CA
03/04/2006 Faculty lunch in the department of Computer Science, Stanford
10/30/2005 DARPA Topological Data Analysis Program Annual Meeting, San Rafael, CA
07/25/2005 ITR Meeting on Deformable Modeling, Rutgers University
07/07/2004 Vienna University of Technology, Vienna
05/19/2004 DARPA/NSF CARGO Program, Madison, WI
05/26/2003 DARPA/NSF CARGO Program, Santa Rosa, CA

5 Teaching

Image Processing, UCL, Fall 2011-12

Advanced Topics in Geometry Processing, TU Vienna, Spring 2010-11

Advanced Computer Graphics, KAUST, Spring 2010-11

Advanced Topics in Geometry Processing, TU Vienna, Fall 2010-11

Computer Graphics, KAUST, Fall 2010-11

Advanced Topics in Geometry Processing, TU Vienna, Spring 2009-10

Advanced Computer Graphics, KAUST, Spring 2009-10

Computer Graphics, KAUST, Fall 2009-10

Advanced Computer Graphics, IIT Delhi, Spring 2008-09

Introduction to Computer Graphics, IIT Delhi, Fall 2008-09

Computer Vision, IIT Delhi, Spring 2007-08

Introduction to Computer Graphics, IIT Delhi, Fall 2007-08

5.1 *Short Courses*

W. Chang, H. Li, N. J. Mitra, M. Pauly, M. Wand, Dynamic Geometry Processing, Eurographics 2012 course.

W. Chang, H. Li, N. J. Mitra, M. Pauly, S. Rusinkiewicz, M. Wand, Computing Correspondences in Geometric Data Sets, Eurographics 2011 course.

W. Chang, H. Li, N. J. Mitra, M. Pauly, M. Wand, Geometric Registration for Deformable Shapes, Eurographics 2010 course.

N. J. Mitra, Introduction to Geometry Processing, Adobe (India) 2009.

5.2 *Summer Schools*

CMU Qatar, May-June 2011 (organizer/instructor)

IIT Delhi, May-July 2009 (organizer/instructor)

IIT Delhi, May-July 2008 (organizer/instructor)

IIT Delhi, May-July 2007 (organizer/instructor)

6 Major Awards

2007 - 2009 Outstanding Young Faculty Fellowship, sponsored by Microsoft (India)

2006 Stanford Business School Fellowship

2000 - 2005 Stanford Graduate Fellowship (Joseph W. and Hon Mai Goodman Fellowship)

1999 President's Silver Medal, IIT, Kharagpur

1999 Swapan Kumar Saha Memorial Award, IIT, Kharagpur

1999 Bigyan Sinha Memorial Award, IIT, Kharagpur

1999 Institute Proficiency Prize for Best Project, IIT, Kharagpur

1995 Jagadish Bose National Science Talent Search Award

6.1 Exhibits/artwork

Shadow Art led to the production of *Silhouettes of Jazz*, which was nominated as the top three for Best in Show Award SIGGRAPH 2009 Computer Animation Festival (webpage: <http://www.silhouettesofjazz.com/>).

6.2 Media Coverage

Reported in science media including New Scientist, Science et Vie Junior, Science Daily, Technology Review, Jerusalem Post, etc.

Last updated: April 4, 2012