

Ariel Shamir

Curriculum Vitae

Personal Information

Birth: June 7th, 1966, Evanston IL, USA
Citizenship: USA & Israel .
Address: Efi Arazi School of Computer Science
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Positions

ASSOCIATE PROFESSOR (2009 - present), the Efi Arazi School of Computer Science, The Interdisciplinary Center, Herzliya.

ALGORITHMIC RESEARCH MANAGER (2005 - present), Sensomatix Ltd.

VISITING SCIENTIST (Summer 2008, 2009, 2010, 2011), Disney Research, Glendale, California & Disney Research, Pittsburgh, Pennsylvania.

SENIOR LECTURER (2006 - 2009), the Efi Arazi School of Computer Science, The Interdisciplinary Center, Herzliya.

VISITING SCIENTIST (2006 - 2007 Sabbatical), Mitsubishi Electric Research Laboratories, Cambridge, Massachusetts.

LECTURER (2000 - 2006), the Efi Arazi School of Computer Science, The Interdisciplinary Center, Herzliya.

VISITING SCIENTIST (Summer 2002), Lawrence Livermore National Laboratory, Livermore, California.

POST-DOCTORAL FELLOW (1999 - 2000), The Center for Computational Visualization of TICAM, University of Austin, Texas.

CHIEF SCIENTIST & MANAGER R&D (1995 - 2001), Heshev Developments Ltd.

COMPUTER SCIENCE TEACHER (1995 - 1998), High-school for Science and Art, Jerusalem.

RESEARCH ASSISTANT (1995 - 1998), The Institute of Computer Science, The Hebrew University.

TEACHING ASSISTANT (1993 - 1998), The Institute of Computer Science, The Hebrew University.

SENIOR SOFTWARE ENGINEER (1991 - 1995), Heshev Developments Ltd.

Education

- 1999: Ph.D. in Computer Science, the Hebrew University, Jerusalem, Israel
- 1996: M.Sc. in Computer Science, the Hebrew University, Jerusalem, Israel
- 1991: B.Sc. Cum Laude. in Mathematics and Computer Science, the Hebrew University, Jerusalem, Israel

Professional Activity

Membership

ACM SIGGRAPH, IEEE Computer Society, and Eurographics.

Invited Talks

- YNET Ideas Channel, 2012: *Micro Human Computation*
- NASA Goddard Space Flight Center, Greenbelt, Md., Information Science and Technology Colloquium, March 30, 2011: *Interactive Image Manipulations: Color, Size and Structure*.
- TEDxTelAviv, April 26, 2010, Jaffa Port, Israel: *The vision of the image*.
- Shape Modeling International SMI'10, June 21–23, 2010, Aix-en-Provence, France: *A volumetric view of shapes*.
- Media Retargeting Workshop (in conjunction with ECCV 2010), September 10, 2010, Crete, Greece: *Future directions for Retargeting*.

Courses & Tutorials

- A. Shamir & O. Sorkine, *Visual Media Retargeting*, Siggraph Asia 2009.
- A. Shamir, *Strategies for Mesh Segmentation*, AIM@SHAPE Summerschool 2007: Shape Modeling and Reasoning.
- A. Shamir, *Mesh Segmentation: State of the Art Report*, Eurographics 2006.
- J. El-Sana, L. De Floriani, E. Puppo, A. Shamir, *View-Dependent Rendering for Polygonal Data-sets*, Eurographics 2002.

Editorials

- Associate Editor, *Computers & Graphics: An International Journal of Systems & Applications in Computer Graphics* (Elsevier), 2010–present.
- Niloy Mitra, Olga Sorkine, Ariel Shamir, Ayellet Tal, Guest Editors, *Computers & Graphics*, Vol. 35, No. 3, 2011, Special Issue : Shape Modeling International (SMI) Conference 2011.
- Shamir, A., Seungyong, L., Guest Editors, *The Visual Computer*, Vol. 20, No. 4, June 2004, Special Issue on Geometric Modeling.

- Tal, A., Funkhauser, T., Shamir, A., Guest Editors,
Computers & Graphics, Vol. 30, No. 6, 2006, Special issue on Mesh Processing.
- Shamir, A., Fischer, A., Guest Editors,
Journal of Shape Modeling, Special Issue on CAD and Geometric Modeling.

Chairing

International Conference on Shape Modeling, Herzliya, Israel, June 22–24, 2011 (with Prof. Ayellet Tal).

The 2nd China-Israel Bi-National Conference on Graphics and Geometric Computing, Herzliya, Israel, June 19-20, 2010 (with Prof. Shimin Hu)

The 1st China-Israel Bi-National Conference on Graphics and Geometric Computing, Beijing China, October 10-13, 2009

The 6th Korea-Israel Bi-National Conference on Geometric Modeling and Computer Graphics, Haifa, Israel, November 7–9, 2005.

Chair of Central Israel SIGGRAPH Professional Chapter, 2002 – 2005.

Program committees

2012: SMI

2011: Siggraph, Siggraph-Asia, Eurographics, SMI (chair)

2010: Siggraph-Asia, Pacific Graphics, SGP, SMI, 3DPVT, 3DOR, GRAPP

2009: Eurographics, Siggraph Jury, Pacific Graphics, SGP, SMI, 3DOR, GRAPP

2008: Siggraph Jury, Pacific Graphics, SGP, SMI, 3DOR, WSCG, GRAPP

2007: Eurographics, Pacific Graphics, WSCG, GRAPP, ISVC, VRST

2006: SMI, WSCG, ISVC, Afrigraph, VRCIA

2005: Pacific Graphics, WSCG, ICEC

2004: Pacific Graphics, CGI

SGP = Symposium on Geometry Processing, SMI = International Conference on Shape-Modeling and Applications, 3DPVT = International Symposium on 3D Data Processing, Visualization and Transmission, 3DOR = Eurographics Workshop on 3D Object Retrieval, WSCG = Computer Graphics, Visualization and Computer Vision, GRAPP = Computer Graphics Theory and Applications, ISVC = International Symposium on Visual Computing, VRST = Virtual Reality Software and Technology, VRCIA = Virtual Reality Continuum, ICEC = Entertainment Computing, CGI = Computer Graphics International.

Awards & Grants

2011: Israel Science Foundation Grant for 4 years:
“Information Enhanced Media Manipulation and Synthesis”.

2008: IDC President Award for Outstanding Research

2007: Israel Science Foundation Grant for 4 years:
“Reconstruction of Complex Surfaces” (Joint grant).

2007: Israel Ministry of Science and Education Tashtiot Grant for 3 years:

- 2003: “Advanced Methods For Reconstruction Of Three-Dimensional Synthetic Objects” (Joint grant).
IDC President Award for Outstanding Research
- 2002: Israel Ministry of Science and Education Tashtiot Grant for 3 years:
“Fundamentals of Virtual Reality and Medical Applications” (Joint grant).

Teaching

- **Computer Graphics:**
Spring 2010, Spring 2011, Spring 2012.
- **Geometric Modeling and Visualization:**
Spring 2002, Spring 2003, Spring 2004, Spring 2006, Spring 2009.
- **Introduction to Computer Science in Java:**
Fall 2000, Fall 2001, Fall 2002, Fall 2003, Fall 2004, Fall 2005, Fall 2007, Fall 2008.
- **Machine Learning:**
Fall 2003, Fall 2004, Spring 2008, Fall 2009, Fall 2011.
- **Advanced Seminar on Computer Graphics and Modeling:**
Algorithm Animation: Spring 2002
Level of Details in Graphics and Visualization: Spring 2005
From Shape to Motion: Spring 2006
Images, Features, Patches: Fall 2009
Information Enhanced Graphics: Fall 2010
Semantics in Graphics: Fall 2011

Students

- **Lior Shapira**, Ph.D. Tel Aviv U. 2010. Thesis: Exploration and Analysis of High-Dimensional Visual Feature Space. Msc Tel Aviv U. 2005. Thesis: Mesh Feature Analysis using Geodesic Mean Shift (joint with Prof. D. Cohen-Or).
- **Andrei Sotzio**, Ph.D. Tel Aviv U. 2008. Thesis: Surface Reconstruction Techniques for Imperfect Raw-Data, Msc Tel Aviv U. 2002. Thesis: Hierarchical Shape Matching using Union of Spheres (joint with Prof. D. Cohen-Or).
- **Roy Shilkrot**, MSc. Tel Aviv U. 2011. Thesis: Identity Transfer in Images for Garments Try-On Experience (joint with Prof. D. Cohen-Or).
- **Liad Serruya**, MSc. The Interdisciplinary Center, 2011. Thesis: Image Compression Terrain Simplification (joint with Dr. Boaz Ben-Moshe).
- **Meir-Johnathan Dahan**, MSc. Tel Aviv U. 2010. Thesis: Combining Color and Depth for Enhanced Image Segmentation and Retargeting (joint with Prof. D. Cohen-Or).

- **Roni Zatzarinni**, MSc. Technion 2009. Thesis: Relief Segmentation and Analysis (joint with Prof. A. Tal).
- **Ala Stolpnik**, Msc. Tel Aviv U. 2009. Thesis: Visual Hints for Graph Exploration (joint with Prof. D. Cohen-Or).
- **Michael Rubinstein**, MSc. The Interdisciplinary Center 2009, Thesis: Discrete Approaches for Media Retargeting.
- **Yoav Serbrnik**, MSc. The Interdisciplinary Center 2009, Thesis: Interrogative Visualization of Graphs.
- **Amir Shaham**, Msc. Tel Aviv U. 2004. Thesis: Medial Axis Based Solid Representation (joint with Prof. D. Cohen-Or).

Publications

Journals, Books

1. Yotam Gingold, Ariel Shamir, Daniel Cohen-Or, *Perceptual Micro Human Computation for Visual Tasks*, ACM Transactions on Graphics, to appear, 2012
2. Chen Goldberg, Tao Chen, Fang-Lue Zhang, Ariel Shamir, Shi-Min Hu, *Data-Driven Object Manipulation in Images*, Computer Graphics Forum, Volume 31, Number 3, Special issue: proceedings of Eurographics, 2012
3. Ariel Shamir, Alla Stolpnik, *Multivariate Graphs Exploration using Interactive Visual Queries*, Computers and Graphics, in press, 2012
4. Meir Johnathan Dahan, Nir Chen, Ariel Shamir and Daniel Cohen-Or *Combining Color and Depth for Enhanced Image Segmentation and Retargeting*, The Visual Computer, to appear, 2012
5. Ron Maharik, Mikhail Bessmeltsev, Alla Sheffer, Ariel Shamir, Nathan Carr *Digital Micrography*, ACM Transactions on Graphics, Volume 29, Number 3, (SIGGRAPH Conference Proceedings), 100:1-100:12, 2011
6. Yanzhen Wang, Kai Xu, Jun Li, Hao Zhang, Ariel Shamir, Ligang Liu, Zhiquan Cheng, and Yueshan Xiong, *Symmetry Hierarchy of Man-Made Objects*, Computer Graphics Forum, Volume 30, Number 3, pages 287–296, Special issue: proceedings of Eurographics, 2011
7. Michael Rubinstein, Diego Gutierrez, Olga Sorkine, Ariel Shamir, *A Comparative Study of Image Retargeting*, ACM Transactions on Graphics, Volume 29, Number 5 (Proceedings SIGGRAPH Asia - TOG Article: 160), 2010
8. Shy Shalom, Ariel Shamir, Hao Zhang, Daniel Cohen-Or *Cone Carving for Surface Reconstruction*, ACM Transactions on Graphics, Volume 29, Number 5 (Proceedings SIGGRAPH Asia - TOG Article: 150), 2010

9. Alon Lerner, Yiorgos Chrysanthou, Ariel Shamir, Daniel Cohen-Or *Context-Dependent Crowd Evaluation*, Computer Graphics Forum, Volume 29, Number 7, pages 2197–2206, Special issue: proceedings of the 18th Pacific Conference on Computer Graphics and Applications, 2010.
10. L. Shapira, S. Shalom, A. Shamir, D. Cohen-Or, and H. Zhang, *Contextual Part Analogies in 3D Objects*, International Journal of Computer Vision, Volume 89 , Issue 2-3 (September 2010) pages 309–326, 2010
11. Rony Zatzarinni, Ayellet Tal, Ariel Shamir, *Relief Analysis and Extraction* ACM Transactions on Graphics, Volume 28, Number 5, (SIGGRAPH ASIA Conference Proceedings), 2009
12. Tao Chen, Cheng Ming Ming, Shi-Min Hu, Ping Tan, Ariel Shamir *PhotoSketch: Internet Image Montage*, ACM Transactions on Graphics, Volume 28, Number 5, (SIGGRAPH ASIA Conference Proceedings), 2009
13. Rubinstein, M., and Shamir, A., and Avidan, S. *Multi-operator Media Retargeting*, ACM Transactions on Graphics, Volume 28, Number 3, (SIGGRAPH Conference Proceedings) 2009
14. Shamir, A., and Avidan, S., *Seam carving for media retargeting*, Communications of the ACM, Volume 52, Number 1, pages 77-85, January 2009
15. Shapira, L., Shamir, A., Cohen-Or, D. *Image Appearance Exploration by Model Based Navigation*, Computer Graphics Forum, Volume 28, number 2, (Eurographics 2009 Conference Proceedings) Second best paper award.
16. Liu, F., Zhang, H., Shamir, A., Cohen-Or, D. *A Part-aware Surface Metric for Shape Processing*, Computer Graphics Forum, Volume 28, number 2, (Eurographics 2009 Conference Proceedings)
17. Kraevoy, V., Sheffer, A., Shamir, A., Cohen-Or, D. *Non-homogeneous Resizing of Complex Models*, ACM Transactions on Graphics, Volume 27, Number 5, December (SIGGRAPH ASIA Conference Proceedings), 2008
18. Shapira L., Shamir, A., *Local Geodesic Parametrization: An Ant's Perspective*, in "Mathematical Foundations of Scientific Visualization, Computer Graphics, and Massive Data Exploration". Moller, Torsten; Hamann, Bernd; Russel, Robert (Eds.) Series: Mathematics and Visualization, Springer, 2009
19. Shamir A., *A Survey on Mesh Segmentation Techniques*, Computer Graphics Forum, Volume 27, Number 6: pages 1539-1556, 2008.
20. Rubinstein, M., and Shamir, A., and Avidan, S. *Improved Seam carving for Video Retargeting*, ACM Transaction on Graphics, Volume 27, Number 3, (SIGGRAPH Conference Proceedings), 2008
21. Shamir A., Cohen-Or D., Shapira, L., *Consistent Mesh Partitioning, and Skeletonization*, The Visual Computer, Volume 24, number 4: pages 249–259 ,2008.

22. Avidan, S. and Shamir, A., *Seam carving for content aware image resizing*, ACM Transaction on Graphics, Volume 26, Number 3, (SIGGRAPH 2007 Conference Proceedings).
23. Sharf, A., Lewiner, T., Shamir, A., Kobbelt, L., *On-the-fly Curve Skeleton Computation for 3D Shapes*, Computer Graphics Forum, Volume 26, number 3, September 2007, pages 323–328 (Eurographics 2007 Conference Proceedings).
24. Gal, R., Shamir, A., Cohen-Or D., *Pose-Oblivious Shape Signature*, IEEE Transactions on Visualization and Computer Graphics, Volume 13, No. 2, pp. 261–271, 2007.
25. Sharf, A., Blumenkrants, M., Shamir, A., and Cohen-Or, D., *Snap-Paste: An Interactive Technique for Easy Mesh Composition*, The Visual Computer, Volume 22, No. 9-11, pages 835–844, September, (Pacific Graphics 2006 Conference Proceedings).
26. Sharf, A., Lewiner, T., Shamir, A., Kobbelt, L., Cohen-Or, D., *Competing Fronts for Coarse-to-Fine Surface Reconstruction*, Computer Graphics Forum, Volume 25 No. 3, pages 389–398, (Eurographics 2006 Conference Proceedings).
27. Shamir, A., Rubinstein, M., Levinboim, T., *Generating Comics From 3D Interactive Computer Graphics*, IEEE Computer Graphics and Applications, Volume 26, No. 3, pages 30–38, 2006.
28. Shamir, A., Shaham, A., *Skeleton Based Solid Representation with Topology Preservation*, Graphical Models, Volume 68, pages 307–321, 2006.
29. Shamir, A., Shapira L., Cohen-Or, D., *Mesh Analysis using Geodesic Mean Shift*, The Visual Computer, Volume 22, pages 1–10, 2006.
30. Lee, Y., Lee, S., Shamir, A., Cohen-Or, D., Seidel, H.-P. *Mesh scissoring with minima rule and part salience*, Computer Aided Geometric Design, special issue on geometry processing, Volume 22, No. 5, pages 444–465, July 2005.
31. Shamir, A., Lee, Y., (guest editors) *Special Section on the Fourth Israel-Korea Bi-National Conference on Geometric Modeling and Computer Graphics*. The Visual Computer Volume 20, No. 4, pages 215–216, 2004.
32. Shamir, A., Sotzio, A., Cohen-Or, D. *Enhanced Hierarchical Shape Matching for Shape Transformation*, International Journal for Shape Modeling IJSM, Volume 9, No. 2, 2003.
33. Shamir, A., *Constraint Based Approach for Automatic Hinting of Digital Typefaces*, ACM Transactions on Graphics, Volume 22, No. 3, pages 131–151, 2003.
34. Bajaj, C., Pascucci, V., Shamir, A., Holt, J. R., Netravali A. N., *Dynamic Maintenance and Visualization of Molecular Surfaces* Discrete Applied Mathematics, Volume 127, No. 1, pages 23–51, 2003.
35. Shamir, A., Rappoport, A., *Compacting Oriental Fonts by Parametric Element Optimization*, The Visual Computer, Volume 15 No. 6, 1999, pp. 302–318.

36. Shamir, A., Rappoport, A., *Quality enhancements of digital typeface boundary representations*. Computers & Graphics, Volume 21, No. 6, special issue on Graphics in Electronic Printing and Publishing, 1997, pp. 713–725.
37. Shamir, A., Rappoport, A., *Extraction of typographic elements from outline representations of fonts*. Computer Graphics Forum, Volume 15, No. 3, 1996 pp. 259–268, Conference issue, proceedings, Eurographics'96 (best Paper Award 3rd place).
38. Shamir, A., *Data Structures*, The Hebrew University Student Press, Jerusalem 1992 (Textbook in Hebrew).

Refereed Conferences

1. Kihwan Kim, Matthias Grundmann, Ariel Shamir, Iain Matthews, Jessica Hodgins, Irfan Essa *Motion Fields to Predict Play Evolution in Dynamic Sport Scenes*, Proc. Computer Vision and Pattern Recognition, CVPR 2010.
2. Alon Lerner, Yiorgos Chrysanthou, Ariel Shamir, Daniel Cohen-Or *Data Driven Evaluation of Crowds* Proceedings MIG 2009: pages 75–83
3. Shapira L., Avidan S., Shamir, A., *Mode-Detection via Median-Shift*, IEEE International Conference on Computer Vision, ICCV 2009.
4. Shapira L., Shalom S., Shamir, A., Cohen-Or, D., *Part Analogies in Sets of Objects*, Eurographics Workshop on 3D Object Retrieval, pages 33–40, 2008.
5. Boaz Ben-Moshe, Liad Serruya, Ariel Shamir *Image Compression Terrain Simplification* Proceedings of the 19th Annual Canadian Conference on Computational Geometry, pages 125–128, 2007.
6. Shamir, A., *Segmentation and shape extraction of 3D boundary meshes*, Eurographics 2006 - State of the Art Reports pages 137–149, 2006.
7. Blumenkrants, M., Starovisky, H., Shamir, A., *Narrative Algorithm Visualization*, Proceedings ACM Symposium on Software Visualization, pages 17–26, September 2006.
8. Lau, E., Sharlin, E., Shamir, A., *A Robotic Interface for Retrieval of Distributed Multimedia Content*, The Eleventh International Conference on Distributed Multimedia Systems, (DMS '05), Banff, AB, Canada, Sep. 2005.
9. Lee, Y., Lee, S., Shamir, A., Cohen-Or, D., Seidel, H.-P. *Intelligent Mesh Scissoring Using 3D Snakes*, Proceedings Pacific Graphics 2004, pages 279–287.
10. Shamir, A., *A Formulation of Boundary Mesh Segmentation*, Proceedings of the 2nd International Symposium on 3D Data Processing, Visualization & Transmission 2004 (3DPVT '04), pages 82–89.
11. Shaham, A., Shamir, A., Cohen-Or, D., *Medial Axis Based Solid Representation*, Proceedings of ACM Symposium on Solid Modeling and Applications 2004, pages 37–44.

12. Sotzio, A., Shamir, A., *Feature Sensitive 3D Shape Matching*, Proceedings Computer Graphics International 2004 (CGI '04), pages 596–599.
13. Friedman, D., Feldman, Y., Shamir, A., Tsvi Dagan, *Automated Creation of Movie Summaries in Interactive Virtual Environments*, Proceedings IEEE Virtual Reality 2004, pages 191–198.
14. Shamir, A., *A View on Views*, Lecture Notes in Computer Science, Vol. 3031, Proceedings Smart Graphics 2004: 4th International Symposium, pages 90–100, Springer-Verlag.
15. Shamir, A. *Feature-Space Analysis of Unstructured Meshes*, Proceedings, IEEE Visualization 2003, Seattle, Washington, pages 185–192.
16. Shamir, A., Pascucci, V., *Temporal and Spatial Level of Details for Dynamic Meshes*, Proceedings, Virtual Reality Systems and Techniques 2001 (VRST '01), Banff, Canada, pages 423–430 .
17. Shamir, A., Pascucci, V., Bajaj, C., *Multi-Resolution Dynamic Meshes with Arbitrary Deformation*, Proceedings IEEE Visualization 2000, Salt Lake City, Utah, pages 423–430.
18. Shamir, A., Rappoport, A., *Feature-Based Design of Fonts Using Constraints*. Electronic Publishing, Artistic Imaging and Digital Typography, Proc. of the EP'98 and RIDT'98 Conferences, St Malo, March 30 - April 3, 1998 Eds. Roger D. Hersch, Jacques Andre, Heather Brown, LNCS, Springer Verlag, 1998

Other Publications

1. Shamir A., Cohen-Or D., Shapira, L., *Consistent Partitioning of Meshes*, Technical report Tel-Aviv University 2005.
2. Shamir, A., Shapira, L., Cohen-Or, D., Goldental, R. *Geodesic Mean Shift*, Proc. 5th Korea Israel binational conference on geometric modeling and computer graphics, Seoul 2004, pages 51–56.
3. Shamir, A., Sotzio, A., Cohen-Or, D. *Hierarchical Shape Matching and Transformation using Union of Spheres*, Proc. Israel-Korea bi-national conference on geometric modeling and computer graphics, 2003.
4. Bajaj, C., Shamir, A., Sohn, B.-S. *Progressive Tracking of Isosurfaces in Time-Varying Scalar Fields*, CS & TICAM Technical Report TR-02-4, University of Texas at Austin, 2002
5. Shamir, A., Pascucci, V., Bajaj, C., *T-DAG : a Multi-Resolution Model for Time-Dependent Visualization* Technical Report, Texas Institute for Computational and Applied Mathematics.

6. Bajaj, C., Pascucci, V., Shamir, A., Holt, J. R., Netravali A. N., *Multi-resolution Molecular Shapes* Technical Report 99-42, Texas Institute for Computational and Applied Mathematics.
7. Shamir, A., Rappoport, A., *Digital Typefaces from Geometric Modeling Perspective*, Proc. Israel-Korea bi-national conference on geometric modeling, 1998.
8. Shamir, A., Rappoport, A., *Dynamic Typography*, Technical report, Institute of Computer Science, The Hebrew University, 1998.
9. Shamir, A., Rappoport, A., *LiveType: a Parametric Font Model Based on Features and Constraints*. Technical Report TR-97-11, Institute of Computer Science, The Hebrew University, 1997 (Technical Sketch presentation in SIGGRAPH'97).