Andrei Sharf 13/03/2023

CURRICULUM VITAE AND LIST OF PUBLICATIONS

• Personal Details

Name:	Andrei Sharf
Date and place of birth:	29.09.1973, Romania
Date of immigration:	20.01.1983
Regular military service:	1992-1995
Address at work:	Alon Building, 110, Ben Gurion University, Beer Sheva, Tel: 08-6428009
Address at home:	Duchifat str. 17, Ra'anana, 054-8194494
Orcid id	0000-0002-3963-4508

• Education

B.Sc. - 1996-1999, Technion, Computer Science Dept.

M.Sc. - 1999-2002, Tel-Aviv University, Computer Science Dept.
Advisors: Prof. Daniel Cohen-Or, Dr Ariel Shamir
Title: “Topology Based Progressive Shape Transformations” Cum Laude

PhD. - 2002-2007, Tel-Aviv University, Computer Science Dept.
Advisors: Prof. Daniel Cohen-Or, Dr Ariel Shamir
Title: “Surface Reconstruction Techniques for Imperfect Raw-Data"

• Employment History

2014-current **Associate Professor, Head of Visual Computing and Computer Graphics Lab, VCCG, Ben-Gurion University**
Ben-Gurion University, Israel

2010-2014 **Senior Lecturer**
Ben-Gurion University, Israel

2009-2010 **Visiting Associate Professor**
Center of Visual Computing, Shenzhen Institute of Advanced Technology(SIAT) Chinese Academy of Sciences, Shenzhen, China

2007-2009 **Postdoctoral Researcher**
Institute of Data Analysis and Visualization (IDAV)
Dept. of Computer Science, University of California Davis, USA

• Professional Activities

(a) Positions in academic administration

2020-current **Promotion Committee** (deputy), Computer Science Department
2018-current **Funding and Prizes Committee,** Computer Science Department
2016-2018 **Head of Program,** Software Engineering
2014-2016 **Deputy Head of Program,** Software Engineering
2011-2014 **Head of Excellence Programs,** Computer Science Department

(b) Significant professional consulting

2021-2022 **VP R&D, AI,** Ultrawis
2001-2002 **Project Leader**, Comverse
1999-2001 **Senior Engineer**, Gaya Software Industries
1997-1999 **Software Engineer**, Intel Development Center

(c) Editor of Scientific Journal

Journal: Computer Graphics Forum (Wiley)
Period: 2015- current
Journal: Computers & Graphics (Elsevier)
Period: 2011- 2018

(d) Membership in professional/scientific societies

Program Chair:

2020 Binational Science Foundation (science advisor)
2014 ACM SIGGRAPH Asia Posters
2014 ACM SIGGRAPH Asia Technical Briefs
2013 ACM SIGGRAPH Asia Posters
2013 ACM SIGGRAPH Asia Technical Briefs

Program Committee member:

ACM SIGGRAPH 2012,2013
ACM SIGGRAPH ASIA 2011,2013,2014,2016
EUROGRAPHICS 2015, 2017, 2018
Eurographics/ACM SIGGRAPH Symposium on Geometry Processing, 2013, 2015, 2016, 2017
Pacific Graphics (PG) 2011,2012
Shape Modeling International (SMI) 2011, 2012, 2013, 2017
CAD/Graphics International 2015
ACM Symposium on Interactive 3D Graphics and Games (I3D) 2011, 2012, 2013
SIBGRAPI 2011
Computational Visual Media Conference (CVM) 2012, 2020, 2021
Conf. on Computer Graphics, Visualization and Computer Vision (WSCG) 2019

(e) Ad-hoc reviewer for journals

ACM Transactions on Graphics,
IEEE Transactions on Visualization and Computer Graphics,
Journal of Computer Aided Geometric Design,
Computer Graphics Forum,
The Visual Computer
Journal of Computers & Graphics (Elsevier),
International Journal for Shape Modeling,

• **Educational activities**

(a) Courses taught

- Video Games Programming, Advanced, Ben-Gurion University
- Advanced Topics in 3D Geometry Processing, Advanced, Ben-Gurion University
- Seminar in Deforming 3D Geometry, Advanced, Tel-Aviv University
- Seminar in Urban Modeling, Advanced, Tel-Aviv University
- Advanced topics in Computer Graphics, Advanced, Tel-Aviv University
- Workshop in Computer Graphics, Advanced, Tel-Aviv University
- Computer Graphics, Undergraduate, Ben-Gurion University
- Systems Programming, Undergraduate, Ben-Gurion University
- Operating systems, Undergraduate, Tel-Aviv University
- Software programming, Undergraduate, Tel-Aviv University
- Introduction to C language, Undergraduate, Tel-Aviv University

(b) Research students

Graduated:

2010-2013	Tamir Grossinger, M.Sc.
2010-2014	Niv Gafni, M.Sc.
2011-2014	Kirill Pevzner, M.Sc. (w. Prof. El-Sana)
2012-2015	Feilong Yan, PhD. (w. Prof. Baoquan Chen)
2013-2015	Yonatan Svirsky M.Sc.
2012-2016	Ke Xie, PhD. (w. Prof. Baoquan Chen)
2012-2016	Alexei Gaissinski, M.Sc. (w. Shai Avidan)
2017-2020	Tsahi Saporta M.Sc.
2017-2020	Gil Melnik M.Sc.
2018-2021	Eyal Reisfeld M.Sc.
2019-2022	Sharon Coper M.Sc.
2019-2022	Or Hayat M.Sc.
2019-2022	Hedi Zisling M.Sc.
2019-2022	Nir BenZikri M.Sc.
2019-2022	Bar SimanTov M.Sc.
2019-2022	Almog Dubin M.Sc.
2019-2022	Kathy Smoliansky M.Sc. (w. Assaf Zaritsky)

PostDoc:

2013-2014	Yann Savoye PostDoc.
2016-2017	Stuti Awashti

PhD.:

2015-present	Yonatan Svirsky.
2017-present	Tamir Grossiner.
2022- present	Shai Aharon

M.Sc.

2022- present Shai Aharon

• **Awards**:

2015 **TORONTO PRIZE for Excellence in Research**
2013/2014 **Ralph Selig Career Development Chair in Information Theory**
2012 **EUROGRAPHICS Young Researcher Award**

• **Scientific Publications**

a) h-index: 22 (according to ISI)
h-index: 26 (according to Google Scholar)
i10-index: 36 (according to Google Scholar)

b) Total number of citations:
2031 (according to ISI)
4363 (according to Google Scholar)

c) Total number of citations without self-citations:
1789 (according to ISI)
3550 (according to Google Scholar)

Refereed articles in scientific journals

1. Ariel Shamir[PI], **Andrei Sharf**[S], Daniel Cohen-Or[PI], 2003
   Enhanced Hierarchical Shape Matching for Shape Transformation
   International Journal for Shape Modeling (IJSM), (9) 203–222,
   Citations(GS)=14, (ISI)=X, IF=0.44

2. **Andrei Sharf**[S], Marc Alexa[PI], Daniel Cohen-Or[PI], 2004
   Context-based Surface Completion
   ACM Transactions on Graphics, (23) 878-887 (Proceedings of SIGGRAPH)
   Citations(GS)=251 (ISI)=103, IF=4.384, JR=3 of 104 (in Computer Science, Software Engineering), Q1

3. **Andrei Sharf**[S], Thomas Lewiner[S], Ariel Shamir[PI], Leif Kobbel[PI]t, Daniel Cohen–Or[PI], 2006
   Competing Fronts for Coarse–to–Fine Surface Reconstruction
   Computer Graphics Forum, (25) 389-398 (Proceedings of Eurographics)
   Citations(GS)=83 (ISI)=29, IF= 2.046, JR=22 of 104 (in Computer Science, Software Engineering), Q1

4. **Andrei Sharf**[S], Marina Blumenkrants[S], Ariel Shamir[PI], Daniel Cohen–Or[PI], 2006
   SnapPaste: An Interactive Technique for Easy Mesh Composition
   The Visual Computer, (22) 835-844
   Citations(GS)=101 (ISI)=50, IF=1.036, JR= 53 of 106 (in Computer Science, Software Engineering), Q2

5. **Andrei Sharf**[S], Thomas Lewiner[S], Gil Shklarski[S], Sivan Toledo[PI], Daniel Cohen–Or[PI], 2007
   Interactive Topology-aware Surface Reconstruction
   ACM Transactions on Graphics, (26) 43:1-9 (Proceedings of SIGGRAPH)
   Citations(GS)=86 (ISI)=10, IF=4.384, JR=3 of 104 (in Computer Science, Software Engineering), Q1

6. **Andrei Sharf**[S], Thomas Lewiner[S], Ariel Shamir[PI], Leif Kobbelt[PI], 2007
   On-the-fly Curve-skeleton Computation for 3D Shapes
   Computer Graphics Forum, (26) 323-328 (Proceedings of Eurographics)
   Citations(GS)=102 (ISI)=41, IF= 2.046, JR=22 of 104 (in Computer Science, Software Engineering), Q1

7. **Andrei Sharf**[PD], Dan A. Alcantara[S], Thomas Lewiner[PI], Chen Greif[PI], Alla Sheffer[PI], Nina Amenta[PI], Daniel Cohen-Or[PI], 2008
   Space-time Surface Reconstruction Using Incompressible Flow
   ACM Transactions on Graphics, (27) 110:1-10 (Proceedings of SIGGRAPH)
   Citations(GS)=90 (ISI)=27, IF=4.384, JR=3 of 104 (in Computer Science, Software Engineering), Q1

8. Fatemeh Abbasinejad[S], Yong J. Kil[S], **Andrei Sharf**[PD], Nina Amenta[PI], 2009
   Rotating Scans for Systematic Error Removal
   Computer Graphics Forum, (28) 1319-1326 **(2nd Best Paper Award)**
   Citations(GS)=10 (ISI)=6, IF= 2.046, JR=22 of 104 (in Computer Science, Software Engineering), Q1

9. Dan A. Alcantara[S], **Andrei Sharf**[PD], Fatemeh Abbasinejad[S], Shubhabrata Sengupta[S], Michael Mitzenmacher[PI], John D. Owens[PI], Nina Amenta[PI], 2009
   Real-Time Parallel Hashing on the GPU
   ACM Transactions on Graphics (28) 154:1-9 (Proceedings of SIGGRAPH)
   Citations(GS)=171 (ISI)=40, IF=4.384, JR=3 of 104 (in Computer Science, Software Engineering), Q1

10. Qian Zheng[S], **Andrei Sharf**[PD], Andrea Tagliasacchi[S], Baoquan Chen[PI], Hao Zhang[PI], Alla Sheffer[PI], Daniel Cohen-Or[PI], 2010
    Consensus Skeleton for Non-rigid Space-time Registration
    Computer Graphics Forum, (29) 635—644 (Proceedings of Eurographics)
    Citations(GS)=65 (ISI)=34, IF= 2.046, JR=22 of 104 (in Computer Science, Software Engineering), Q1

11. Liangliang Nan[S], **Andrei Sharf**[PD], Hao Zhang[PI], Daniel Cohen-Or[PI], Baoquan Chen[PI], 2010
    SmartBoxes for Interactive Urban Reconstruction
    ACM Transactions on Graphics, (29) 93:1-10 (Proceedings of SIGGRAPH)
    Citations(GS)=142 (ISI)=43, IF=4.384, JR=3 of 104 (in Computer Science, Software Engineering), Q1

12. Qian Zheng[S], **Andrei Sharf**[PD], Guowei Wan[S], Yangyan Li[S], Niloy J. Mitra[PI], Daniel Cohen-Or[PI], Baoquan Chen[PI], 2010
    Non-local Scan Consolidation for 3D Urban Scenes

ACM Transactions on Graphics, (29) 94:1-9 (Proceedings of SIGGRAPH)
Citations(GS)=117 (ISI)=25, IF=4.384, JR=3 of 104 (in Computer Science, Software Engineering), Q1

13. Haim Avron[S], **Andrei Sharf**[PI], Chen Greif[PI], Daniel Cohen-Or[PI], 2010
l1-Sparse Reconstruction of Sharp Point Set Surfaces
ACM Transactions on Graphics, (29) 135:1-12
Citations(GS)=103 (ISI)=51, IF=4.384, JR=3 of 104 (in Computer Science, Software Engineering), Q1

14. Nina Amenta[PI], Deboshmita Ghosh[S], **Andrei Sharf**[PI], F James Rohlf[PI], Will Harcourt-Smith[PI], Steve Frost[PI], David Wiley[PI], Katherine St John[PI], Eric Delson[PI], 2010
Evolutionary morphing
American Journal of Physical Anthropology
Citations(GS)=1 (ISI)=X, IF=2.901, JR= 22 of 49 (in Evolutionary Biology), Q2

15. Jinjie Lin[S], Daniel Cohen-Or[PI], Hao Zhang[PI], Cheng Liang[S], **Andrei Sharf**[PI], Oliver Deussen[PI], Baoquan Chen[PI], 2011
Structure-Preserving Retargeting of Irregular 3D Architecture
ACM Transactions on Graphics, (30) 183:1-10 (Proceedings of SIGGRAPH)
Citations(GS)=62 (ISI)=15, IF=4.384, JR=3 of 104 (in Computer Science, Software Engineering), Q1

16. Liangliang Nan[S], **Andrei Sharf**[PI], Ke Xie[S], Tien-Tsin Wong[PI], Oliver Deussen[PI], Daniel Cohen-Or[PI], Baoquan Chen[PI], 2011
Conjoining Gestalt Rules for Abstraction of Architectural Drawings
ACM Transactions on Graphics, (30) 185:1-10 (Proceedings of SIGGRAPH)
Citations(GS)=47 (ISI)=14, IF=4.384, JR=3 of 104 (in Computer Science, Software Engineering), Q1

17. Yangyan Li[S], Xiaokun Wu[S], Yiorgos Chrysanthou[PI], **Andrei Sharf**[PI], Daniel Cohen-Or[PI], Niloy J. Mitra[PI], 2011
GlobFit: Consistently Fitting Primitives by Discovering Global Relations
ACM Transactions on Graphics, (30) 52:1-12 (Proceedings of SIGGRAPH)
Citations (GS)=193 (ISI)=60, IF=4.384, JR=3 of 104 (in Computer Science, Software Engineering), Q1

18. Liangliang Nan[S], Ke Xie[S], **Andrei Sharf**[PI], 2012
A Search-Classify Approach for Cluttered Indoor Scene Understanding
ACM Transactions on Graphics, (31) 137:1-10 (Proceedings of SIGGRAPH)
Citations (GS)=155 (ISI)=44, IF=4.384, JR=3 of 104 (in Computer Science, Software Engineering), Q1

19. Guowei Wan[S], **Andrei Sharf**[PI], 2012
Grammar-based 3D facade segmentation and reconstruction
Journal of Computers & Graphics, (36), 216-223
Citations (GS)=21 (ISI)=15, IF=1.200, JR= 41 of 106 (in Computer Science, Software Engineering), Q2

20. **Andrei Sharf**[PI], Alice Cheng Liang[S], Jiapei Zhang[S], Minglun Gong[PI], Hui Huang[PI], Baoquan Chen[PI], 2013
Mobility-Trees for Indoor Scenes Manipulation
Computer Graphics Forum
Citations (GS)=9 (ISI)=5, IF= 2.046, JR=22 of 104 (in Computer Science, Software Engineering), Q1

21. Yerry Sofer[S], Tal Hassner[PI], **Andrei Sharf**[PI], 2013
Interactive Learning for Point-Cloud Motion Segmentation
Computer Graphics Forum
Citations(GS)=3 (ISI)=2, IF= 2.046, JR=22 of 104 (in Computer Science, Software Engineering), Q1

22. Matthew Berger[S], Andrea Tagliasacchi[PD], Lee M. Seversky[S], Pierre Alliez[PI], Joshua A. Levine[PI], **Andrei Sharf**[PI], Claudio T. Silva[PI], 2014
State-of-the-art in Surface Reconstruction from Point Clouds
Computer Graphics Forum, STAR Report
Citations(GS)=177 (ISI)=48 , IF= 2.046, JR=22 of 104 (in Computer Science, Software Engineering), Q1

23. Feilong Yan[S], **Andrei Sharf**[PI], Wenzhen Lin[S], Baoquan Chen[PI], 2014
Proactive 3D Scanning of Inaccessible Parts
ACM Transactions on Graphics (Proceedings of SIGGRAPH)
Citations (GS)=17 (ISI)=10, IF=4.384, JR=3 of 104 (in Computer Science, Software Engineering), Q1

24. Lin Lu[PI], **Andrei Sharf**[PI], Haisen Zhao[S], Yuan Wei[S], Qingnan Fan[S], Xuelin Chen[S], Yann Savoye[PD], Change Tu[PI], Daniel Cohen-Or[PI], Baoquan Chen[PI], 2014
Build-to-Last: Strength to Weight 3D Printed Objects
ACM Transactions on Graphics (Proceedings of SIGGRAPH)
Citations (GS)=183 (ISI)=62, IF=4.384, JR=3 of 104 (in Computer Science, Software Engineering), Q1

25. Niv Gafni[S], **Andrei Sharf**[PI], 2014
3D Motion Completion in Crowded Scenes
Computer Graphics Forum,
Citations(GS)=X (ISI)=X, IF= 2.046, JR=22 of 104 (in Computer Science, Software Engineering), Q1

26. Liangliang Nan[PD], **Andrei Sharf**[PI], Baoquan Chen[PI], 2014
2D-3D Lifting for Shape Reconstruction
The Visual Computer,
Citations(GS)=4 (ISI)=3, IF=1.036, JR= 53 of 106 (in Computer Science, Software Engineering), Q2

27. [*] Ke Xie[S], Feilong Yan[S], **Andrei Sharf**[PI], Oliver Deussen[PI], Baoquan Chen[PI], Hui Huang[PI], 2015
Tree Modeling with Real Tree-Parts Examples
IEEE Transactions on Visualization and Computer Graphics,
Citations(GS)=7 (ISI)=3, IF=3.078, JR= 8 of 104 (in Computer Science, Software Engineering), Q1

28. [*] Kirill Prevzner[S], **Andrei Sharf**[PI], Jihad El-Sana[PI], 2015
A Sphere Intersection Descriptor (SID)
Journal of Computer Aided Geometric Design
Citations(GS)=2 (ISI)=1, IF=1.522, JR= 43 of 104 (in Computer Science, Software Engineering), Q2

29. [*] Kangxue Yin[S], Hui Huang[PI], Pinxin Long[S], Alexei Gaissinski[S], Minglun Gong[PI], **Andrei Sharf**[PI], 2015
Full 3D Plant Reconstruction via Intrusive Acquisition
Computer Graphics Forum,
Citations(GS)=20 (ISI)=7, IF= 2.046, JR=22 of 104 (in Computer Science, Software Engineering), Q1

30. [*] Qiannan Li[S], Yafang Wang[PI], **Andrei Sharf**[PI], Ya Cao[PI], Changhe Tu[PI], Baoquan Chen[PI], Shengyuan Yu[PI], 2016
Classification of gait anomalies from Kinect
The Visual Computer,
Citations(GS)=5 (ISI)=3, IF=1.036, JR= 53 of 106 (in Computer Science, Software Engineering), Q2

31. [*] Qian Zheng[S], Xiaochen Fan[S], Minglun Gong[PI], **Andrei Sharf**[PI], Oliver Deussen[PI], Hui Huang[PI], 2016
4D Reconstruction of Blooming Flowers
Computer Graphics Forum,
Citations(GS)=7 (ISI)=3, IF= 2.046, JR=22 of 104 (in Computer Science, Software Engineering), Q1

32. [*] Hao Li[S], Guowei Wan[S], Honghua Li[S], **Andrei Sharf**[PI], Kai Xu[PI], Baoquan Chen[PI], 2016
Mobility Fitting using 4D RANSAC
Computer Graphics Forum,
Citations(GS)=4 (ISI)=2, IF= 2.046, JR=22 of 104 (in Computer Science, Software Engineering), Q1

33. [*] Haisen Zhao[S], Lin Lu[PI], Yuan Wei[S], Dani Lischinski[PI], **Andrei Sharf**[PI], Daniel Cohen-Or[PI], Baoquan Chen[PI], 2106
Printed Perforated Lampshades for Continuous Projective Images
ACM Transactions on Graphics (35) 154:1-154:11,
Citations (GS)=7 (ISI)=2, IF=4.384, JR=3 of 104 (in Computer Science, Software Engineering), Q1

34. [*] Kfir Aberman[S], Oren Katzir[S], Qiang Zhou[S], Zegang Luo[S], **Andrei Sharf**[PI], Chen Greif[PI], Baoquan Chen[PI], Daniel Cohen-Or[PI], 2017
Dip Transform for 3D Shape Reconstruction
ACM Transactions on Graphics (Proceedings of SIGGRAPH) (36) 79:1-79:11,
Citations (GS)=4 (ISI)=2, IF=4.384, JR=3 of 104 (in Computer Science, Software Engineering), Q1

35. [*] Zhitao Bo[S], Lin Lu[PI], **Andrei Sharf**[PI], Yang Xia[S], Oliver Deussen[PI], Baoquan Chen[PI], 2017
Printable 3D Trees
Computer Graphics Forum

Citations (GS)=X (ISI)=X, IF= 2.046, JR=22 of 104 (in Computer Science, Software Engineering), Q1

36. [*] Matthew Berger[PI], Andrea Tagliasacchi[PI], Lee M Seversky[PI], Pierre Alliez[PI], Gael Guennebaud[PI], Joshua A Levine[PI], **Andrei Sharf**[PI], Claudio T Silva[PI], 2017
A survey of surface reconstruction from point clouds
Computer Graphics Forum
Citations (GS)=74 (ISI)=28, IF= 2.046, JR=22 of 104 (in Computer Science, Software Engineering), Q1

37. [*] Julian Kratt[S], Till Niese[S], Ruizhen Hu[S], Hui Huang[PI], Soeren Pirk[PD], **Andrei Sharf**[PI], Daniel Cohen-Or[PI], Oliver Deussen[PI], 2018
Sketching in Gestalt Space: Interactive Shape Abstraction through Perceptual Reasoning
Computer Graphics Forum (37) 6:188-6:204
Citations (GS)=4 (ISI)=3, IF= 2.046, JR=22 of 104 (in Computer Science, Software Engineering), Q1

38. [*] Bin Wang[S], Guofeng Wang[S], **Andrei Sharf**[PI], Yangyan Li[PI], Fan Zhong[PI], Xueying Qin[PI], Daniel Cohen-Or[PI], Baoquan Chen[PI], 2018
Active Assembly Guidance with Online Video Parsing
IEEE Virtual Reality
Citations (GS)=4 (ISI)=1, IF=1.375, JR= 49 of 104 (in Computer Science, Software Engineering), Q2

39. [*] Hao Peng[S], Lin Liu[PI], **Andrei Sharf**[PI], Baoquan Chen[PI], 2019
Fabricating QR Codes on 3D Objects using Self-shadows
Journal of Computer-Aided Design, 114:91-100
Citations(GS)= 10 (ISI)=5, IF=1.522, JR= 43 of 104 (in Computer Science, Software Engineering), Q2

40. [*] Xin Yan[S], Cong Rao[S], Lin Lu[PI], **Andrei Sharf**[PI], Haisen Zhao[PI] Baoquan Chen[PI], 2019
Strong 3D Printing by TPMS Injection
IEEE Transactions on Visualization and Computer Graphics (TVCG)
Citations(GS)=6 (ISI)=3, IF=3.078, JR= 8 of 104 (in Computer Science, Software Engineering), Q1

41. [*] L Cheng[S], Z Wei[S], M Sun[S], S Xin[S], **A Sharf**[PI], Y Li[PI], B Chen[PI], C Tu[PI], 2020
DeepPipes: Learning 3D pipelines reconstruction from point clouds
Graphical Models
Citations(GS)=3 (ISI)=1, IF=1.224, JR= of (in Computer Science, Software Engineering), Q2

42. [*] H Peng[S], P Liu[S], L Lu[PI], **A Sharf**[PI], L Liu[PI], D Lischinski[PI], B Chen[PI], 2020
Fabricable Unobtrusive 3D-QR-Codes with Directional Light
Computer Graphics Forum
Citations(GS)=5 (ISI)=3, IF= 2.046, JR=22 of 104 (in Computer Science, Software Engineering), Q1

43. [*] X Liu[S], L Lu[PI], **A Sharf**[PI], X Yan[PI], D Lischinski[PI], C Tu[PI], 2020
Fabricable dihedral Escher tessellations
Computer-Aided Design
Citations(GS)=3 (ISI)=1, IF=1.522, JR= 43 of 104 (in Computer Science, Software Engineering), Q2

44. [*] Y Svirsky[S], **A Sharf**[PI], 2020
A Non-linear Differentiable CNN-Rendering Module for 3D Data Enhancement
IEEE Transactions on Visualization and Computer Graphics
Citations(GS)=2 (ISI)=1, IF=3.078, JR= 8 of 104 (in Computer Science, Software Engineering), Q1

45. [*] M Eliasof[S], **A Sharf**[PI], E Treister[PI], 2020
Multimodal 3D shape reconstruction under calibration uncertainty using parametric level set methods
SIAM Journal on Imaging Sciences
Citations(GS)=3 (ISI)=1, IF= 3.098, JR= of (in Applied Mathematics), Q1

46. [*] G Melnik[S], Y Yekutieli[PI], **A Sharf**[PI], 2021
Deep Segmentation of Corrupted Glyphs
Journal on Computing and Cultural Heritage
Citations(GS)=X (ISI)=X, IF=2.02, JR= 78 of 111 (in COMPUTER SCIENCE, INTERDISCIPLINARY APPLICATIONS), Q1

47. [*] T Saporta[S], **A Sharf**[PI], 2022
Unsupervised recursive deep fitting of 3D primitives to points
Journal of Computers & Graphics
Citations (GS)=X (ISI)=X, IF=1.93, JR= 41 of 106 (in Computer Science, Software Engineering), Q2

48. [*] E Reisfeld[S], **A. Sharf**[PI], 2022
OneSketch: Learning Shape Saliency from Abstract One-stroke Sketches
The Visual Computer
Citations(GS)=X (ISI)=X, IF=1.036, JR= 53 of 106 (in Computer Science, Software Engineering), Q2

<u>Peer-reviewed international conference proceedings (did not appear in journal)</u>

1. **Andrei Sharf**[S], Ariel Shamir[PI], 2004
Feature-sensitive 3D Shape Matching
Proceedings of Computer Graphics International, 596-599
Acceptance Rate: 35%

2. Deboshmita Ghosh[S], **Andrei Sharf**[PD], Nina Amenta[PI], 2009
Feature-driven Deformation for Dense Correspondence
Proceeding of SPIE Medical Imaging
Acceptance Rate: 27%

3. Yangyan Li[S], Qian Zheng[S], **Andrei Sharf**[PI], Daniel Cohen-Or[PI], Baoquan Chen[PI], Niloy J. Mitra[PI], 2011

2D-3D Fusion for Layer Decomposition of Urban Facades
Proceedings of the International Conference on Computer Vision (ICCV), 882-889
Acceptance Rate: 20%

4. Julian Kratt[S], Ferdinand Eisenkeil[S], Soeren Pirk[S], **Andrei Sharf**[PI], Oliver Deussen[PI] 2014
Non-realistic 3D object stylization
Proceedings of the Workshop on Computational Aesthetics (CAe), 67-75
Acceptance Rate: 40%

5. [*] Kang Feng[S], Yafang Wang[PI], Gerard de Melo[PI], **Andrei Sharf**[PI], Baoquan Chen[PI], 2016
ShapeLearner: Towards Shape-Based Visual Knowledge Harvesting
European Conference on AI (ECAI)
Acceptance Rate: 27%

6. [*] T Saporta[S], **A Sharf**[PI], 2021
Unsupervised recursive deep fitting of 3D primitives to points
Proceedings of Pacific Graphics
Acceptance Rate: 33%

7. [*] X Yan[S], L Lu[PI], **A Sharf**[PI], X Yu[S], Y Sun[S], 2021
Man-made by Computer: On-the-Fly Fine Texture 3D Printing
Symposium on Computational Fabrication (SCF '21)

8. [*] T Xue[S], L Lu[PI], **A Sharf**[PI], L Tian[S], H Li[S], 2022
DancingPottery: Posture-Driven Pottery Generative Design and Fabrication (in Symposium on Computational Fabrication)

9. [*] N Ben Zikri[S], **A Sharf**[PI], 2022
PhyLoNet: Physically-Constrained Long Term Video Prediction (in ACCV)
Acceptance Rate: 33%

Published scientific reports and technical papers

Surface Reconstruction Techniques for Imperfect Raw-Data
Andrei Sharf, Ph.D. Thesis. Tel-Aviv University, 2007

• **Lectures and Presentations**

(a) Invited plenary lectures at conferences/meetings

2022 “Visual Computing” Summer School, Qindao, China

2021 “Visual Computing” Summer School, Qindao, China

2022 “Deep learning for Nano-photonics”, Keynote, 6th “Visual Computing” Summer School, Qindao, China, http://irc.cs.sdu.edu.cn/2020-summer-school/en-index.html

2021 “Deep learning for Nano-photonics”, Keynote, 6th “Visual Computing” Summer School, Qindao, China, http://irc.cs.sdu.edu.cn/2020-summer-school/en-index.html

2020 “Deep learning for Nano-photonics”, Keynote, 6th “Visual Computing” Summer School, Qindao, China, http://irc.cs.sdu.edu.cn/2020-summer-school/en-index.html

2019 “A Non-linear Differential CNN-Rendering Module for 3D Data”, Keynote, 5th “Visual Computing” Summer School, Qindao, China, http://irc.cs.sdu.edu.cn/2019-summer-school/en-index.html

2018 “3D Differential Rendering Neural Networks”, Keynote, 4th “Visual Computing” Summer School, Qindao, China, http://irc.cs.sdu.edu.cn/2018-summer-school/en-index.html

2017 “Adaptive Shape Sensing with Neural-Networks”, Keynote, 3rd “Visual Computing” Summer School, Qindao, China, http://irc.cs.sdu.edu.cn/2017-summer-school/en-index.html

2016 “"Closing the loop: from acquisition to manufacturing 3D"”, 3rd Israel China Conference on Graphics and Geometric Computing, Kunming, China

2016 “3D urban reconstruction and modeling”, Keynote, 5th Edition of creatiVE Summer School in Virtual Environments, Constanza, Romania, www.creative.cerva.ro

2016 2nd “Visual Computing” Summer School, Qindao, China

2015 1st “Visual Computing” Summer School, Qindao, China

2013 Human Computer Interaction and Virtual Reality Lab, School of Computer Science and Technology, Shandong University, Jinan, China

2011 2nd Israel China Conference on Graphics and Geometric Computing, The Interdisciplinary Center, Israel

2009 1st Israel China Conference on Graphics and Geometric Computing, Tsinghua University, China

2008 “CITY” Modeling Workshop, Chinese Academy of Sciences (CAS) SIAT, China

2007 6th Workshop on Geometric Computing, Israel

2006 Invited Talk, Microsoft Research Asia (MSRA) Beijing, China

2006 5th Workshop on Geometric Computing, Israel

2004 3rd Workshop on Geometric Computing, Israel

2003 4th Israel-Korea Conference on Geometric Modeling and Graphics, Israel

(b) Presentation of papers at conferences

Hao Li, Guowei Wan, Honghua Li, Andrei Sharf, Kai Xu, Baoquan Chen, 2016
Mobility Fitting using 4D RANSAC
Eurographics Symposium on Geometry Processing

Niv Gafni, Andrei Sharf, 2014
3D Motion Completion in Crowded Scenes
Symposium on Geometry Processing, UK

Andrei Sharf, 2014
Proactive 3D Acquisition (Keynote)
Geometric Modeling and Processing, Singapore

Yerry Sofer, Tal Hassner, Andrei Sharf, 2013
Interactive Learning for Point-Cloud Motion Segmentation
Pacific Graphics, Singapore

Liangliang Nan, Ke Xie, Andrei Sharf , 2012
A Search-Classify Approach for Cluttered Indoor Scene Understanding
SIGGRAPH Asia, Singapore

Yangyan Li, Xiaokun Wu, Yiorgos Chrysanthou, Andrei Sharf, Daniel Cohen-Or, Niloy J. Mitra, 2011
GlobFit: Consistently Fitting Primitives by Discovering Global Relations
SIGGRAPH, Vancouver, Canada

Jinjie Lin, Daniel Cohen-Or, Hao Zhang, Cheng Liang, Andrei Sharf, Oliver Deussen, Baoquan Chen, 2011
Structure-Preserving Retargeting of Irregular 3D Architecture
SIGGRAPH Asia, Hong Kong

Liangliang Nan, Andrei Sharf, Ke Xie, Tien-Tsin Wong, Oliver Deussen, Daniel Cohen-Or, Baoquan Chen, 2011
Conjoining Gestalt Rules for Abstraction of Architectural Drawings
SIGGRAPH Asia, Hong Kong

Haim Avron, Andrei Sharf, Chen Greif and Daniel Cohen-Or, 2010
An L1-sparse filter for Sharp Point Set Surfaces
SIGGRAPH, Los-Angeles, US

Qian Zheng, Andrei Sharf, Guowei Wan, Yangyan Li, Niloy J. Mitra, Daniel Cohen-Or, Baoquan Chen, 2010
Non-local Scan Consolidation for 3D Urban Scenes
SIGGRAPH, Los-Angeles, US

Liangliang Nan, Andrei Sharf, Hao Zhang, Daniel Cohen-Or, Baoquan Chen, 2010
SmartBoxes for Interactive Urban Reconstruction
SIGGRAPH, Los-Angeles, US

Andrei Sharf, Dan A. Alcantara, Thomas Lewiner, Chen Greif, Alla Sheffer, Nina Amenta, Daniel Cohen-Or, 2008
Space-time Surface Reconstruction Using Incompressible Flow
SIGGRAPH Asia, Singapore

Andrei Sharf, Thomas Lewiner, Ariel Shamir , Leif Kobbelt, 2007
On-the-fly Curve-skeleton Computation for 3D Shapes
Eurographics, Czech Republic

Andrei Sharf, Thomas Lewiner, Gil Shklarski, Sivan Toledo, Daniel Cohen–Or, 2007
Interactive Topology-aware Surface Reconstruction
SIGGRAPH, San-Diego, US

Andrei Sharf, Marina Blumenkrants, Ariel Shamir, Daniel Cohen–Or, 2006
SnapPaste: An Interactive Technique for Easy Mesh Composition
Pacific Graphics, Taipei, Taiwan

Andrei Sharf, Thomas Lewiner, Ariel Shamir, Leif Kobbelt, Daniel Cohen–Or, 2006
Competing Fronts for Coarse–to–Fine Surface Reconstruction
Eurographics, Vienna, Austria

Andrei Sharf, Marc Alexa, Daniel Cohen-Or, 2004
Context-based Surface Completion
SIGGRAPH, Los-Angeles, US

• **Research Grants**

2022-2024 Chinese Academy of Sciences (CAS) President's International Fellowship Initiative (PIFI)
3D Shape Analysis Based on Geometric Deep Learning
Andrei Sharf (PI)
2 years, **60K USD**

2019-2021 KAMIN
Efficient Physical computation of Light Diffraction at Nanoscale
Yonatan Sivan (PI), Andrei Sharf (PI)
2 years, **200K USD**

2015-2018 OMEK consortium (Magnet),
"Scanned points processing and reconstruction"
5 years, **150K USD**

2015-2018 Israel Science Foundation (ISF)- Natural Science Foundation of China (NSFC),
Dani Lishinsky (PI), Andrei Sharf (Co-PI), Daniel Cohen-Or (Co-PI)

"Social Cameras"
3 years, **150K USD**

2014-2018 German-Israeli Foundation for Scientific Research and Development (GIF),
Andrei Sharf (PI), Oliver Deussen (Co-PI), Daniel Cohen-Or (Co-PI)
"3D Stylization"
3 years, 60K EU, **180K EU**

2013-2014 Chinese Academy of Sciences, Young International Scientists,
Andrei Sharf (PI)
"Data-driven modeling and segmentation",
2 years, 50K USD, **100K USD**

2011-2014 Israel Science Foundation (ISF),
Andrei Sharf (PI)
"Multi-modal Fusion and Interaction for 3D modeling"
4 years, 26K USD, **149K USD**, (45K USD ISF-LAB Equipment)

2010- 2013 FP7-Marie Curie International Reintegration Grant,
Andrei Sharf (PI)
"Processing of 3D Digital Cities",
4 years, 36K USD, **144K USD**

2009 - 2010 National Natural Science Foundation of China,
Andrei Sharf (PI)
"Algorithms for Dynamic Scene Reconstruction and Modeling",
2 years, 50K USD, **100K USD**

- **Research Statement**

My research is in the realm of shape modeling and geometry processing. A major part of my research is focused on algorithms for reconstruction and filtering of imperfect scanned data. Nowadays the most common technique for acquisition of 3D shapes is range scanning generating large amounts of raw scanned data. In most cases, graphics applications do not use scan data directly and instead compute an approximating polygonal surface using reconstruction methods. Thus, as 3D scanners are becoming commonplace, surface reconstruction is becoming a common step in modeling workflows.

Within the extensive area of surface reconstruction, I am predominately interested in different algorithmic aspects of processing and reconstruction of imperfect data. Such data is typically generated by scan devices and contains large missing parts, ghost outliers and under-sampled regions. Although acquisition technology constantly advances, scanning complex real-world objects will remain a difficult problem. Due to physical inaccessibility, regions of the object cannot be scanned properly, resulting in missing or under-sampled data. Therefore, the reconstruction of a complete watertight model that is faithful to the original physical object is a difficult process. In order to increase the scanning effective power and usability, there is an emerging need to allow users to create high-quality surfaces from imperfect scans. A unified toolbox including point cloud processing and reconstruction should be developed and supplied to end users. My past and current

research focuses on various fundamental surface reconstruction problems focusing mainly on geometrical and topological problems. Building on this experience, my goal is to develop new technologies to broaden the foundations of 3D surface reconstruction, range scanning methodology and extend its application to additional domains.

In my research I am also interested in interactive techniques in computer graphics. Recently, the use of interactive tools has gained a lot of popularity in various computer graphics applications. Interactive tools are easy-to-use and do not require meticulous work. At the same time, they provide the algorithm minimal but necessary hints needed to solve a problem, which is otherwise extremely hard or even impossible to solve. Over the last years I have been working on different algorithms and applications that involve user interaction for surface reconstruction and 3D shape editing problems. As described below, my research also covered several topics in shape matching, shape analysis and geometric processing. My goal here is to further research interactive tools for computer graphics and broaden the man-machine interaction language.

[Surface Reconstruction.] The importance of detail-preserving and topology awareness in the reconstruction process is constantly growing as more complex highly detailed objects are scanned using fast inaccurate scanning devices. The large errors in scanned data require the reconstruction process to disambiguate noisy regions, complete missing parts with significant data and reconstruct the original, expected shape. However, without prior assumptions the reconstruction problem of poorly sampled areas is ill posed; an infinite number of surfaces pass through or near the data points. In our work (Sharf et al. 2006), we presented a new method that automatically reconstructs a watertight surface that correctly interprets the topology of imperfect scans. The method is based on a deformable model coarse--to--fine reconstruction technique. The deformable model is watertight and along its progression it uses a global structure to maintain watertightness and control its topology. Furthermore, the coarse--to--fine framework enables adaptive handling of non-homogenous sample density, including robustness to missing data in defected areas. This approach yields a better interpretation and control of the reconstructed shape.
Still, in largely deteriorated scans, automatic reconstruction may fail to faithfully reconstruct the expected topology of the model. In a more recent work (Sharf et al. 2007), we introduce an interactive topology-aware reconstruction method: it uses minimal user input to correctly reconstruct regions where the topology of the model cannot be automatically induced. We analyze the local topological stability of a continuous field defined on the point set. Low stability regions are suggested to the user for adding local inside/outside constraints. Each new user constraint modifies the field interactively, converging to a topology-stable correct reconstruction.

Despite the many advances in surface reconstruction from imperfect data, still the common way to complete missing regions is to fill these with a smooth surface. While this works well for small holes relative to the local geometric variation, more complex treatment is required for the general case. First, if fine geometric detail is present around the hole, it should not be missing in the completed region. Second, the topology of the missing piece could be more complex than a disk. In (Sharf et al. 2004) we present a context-based method for completing irregularly sampled surfaces. We analyze the existing surface and by exploiting intra-shape similarities and neighborhood information, holes are filled incrementally. In practice, we complete missing parts in the surface by integrating patches taken from a given example set. Using this method, our experiments show that completing missing parts with details taken from existing parts generate visually correct completions.

[Interactive Techniques.] Despite the constant development of automatic tools and algorithms for computer graphics, the use of interactive tools has been gaining popularity in various computer graphics applications. The creation of digital geometric objects for graphics is a difficult and often expensive process. Despite recent impressive progress in automatic modeling and reconstruction, a fair amount of geometric processing is always done manually. A growing number of works have been targeted at simplifying the interaction and manual manipulation of 3D objects to enable simple and interactive editing. In our work (Sharf et al. 2006) we focus on a user interface operation borrowed from computer editing applications -- the *cut-and-paste* operation. In the context of direct shape manipulation, cut-and-paste is used as a metaphor for cutting and connecting mesh parts and surfaces. Although the basic idea of extracting data from one part and inserting it back into another is simple, there is a need to define the meaning of cutting and pasting for 3D objects in mesh representation. We define an easy-to-use tool which supports cut-and-paste of surface meshes as a simple, natural and intuitive operation. To support simple cutting, we present a simple mesh cutting tool based on a graph-cut procedure. To support simple pasting, we turn to a very useful notion in graphics applications - *snapping*. By extending this notion to 3D surfaces, our tool snaps two mesh parts together with a local graceful warp that respects their initial relative position. Snapping is accomplished using our Soft-ICP algorithm which replaces the global transformation in the ICP algorithm with a set of point-wise locally supported transformations. The technique enhances registration with a set of rigid to elastic transformations that account for simultaneous global positioning and local blending of the objects.

[Shape Descriptors.] Computer graphics applications handle huge models representing complex 3D objects. The most common representations for such objects are boundary meshes or point-sets. However, applications such as editing, animation, morphing or shape matching often need a higher level understanding of the shape and its structure. Such an understanding can be conveyed through the use of an inner curve-skeleton for the object. The curve-skeleton is both concise and expressive enough to represent an abstraction of the 3D object. The main difficulty in computing curve-skeletons for complex objects is to correctly interpret their shape. In our work (Sharf et al. 2006) we present an algorithm to extract the curve skeleton from 3D objects by tracking the reconstruction process of a given object using a deformable model evolution. Since the deformable model reconstructs the original object, we compute the center curve of this model to define the center skeleton of the object itself. The process inherits the robustness of the reconstruction technique, being able to cope with noisy input, intricate geometry and complex topology. Furthermore, it generates a natural segmentation of the object and computes a center curve for each segment while maintaining a full correspondence between the skeleton and the boundary of the object.

In my current work I continue to research different aspects of surface reconstruction with focus on topological and geometrical problems. I am currently working on extending 3D reconstruction principles to handle high dimensional data. One specific problem is reconstruction of 4D data acquired by fast range scanners from 3D dynamic scenes (i.e. time is the fourth dimension).

At another end, I am researching reconstruction problems involving as-rigid-as-possible template fitting. Given a clean template shape and an imperfect target (that shares similar features as the template), our goal is to provide an estimate the target shape by deforming the template to partially fit the target while maintaining its shape as-rigidly-as-possible.

In addition, to continued research on topics mentioned throughout this statement, I plan to use my experience to pursue new problems in a range of old and new domains. One such problem which arises is a conformal reconstruction of sharp features and meaningful parts from imperfect data. This way, sharp features as well as other shape descriptors are induced correctly in the missing and noisy regions. An essential step towards the solution of this problem is the analysis and definition of intra-shape similarities and advanced shape descriptors as well as some possible user interaction assistance.

I expect my future research to continue to focus on different aspects of shape analysis, reconstruction and editing while expanding and blending with other domains and mathematical foundations to broaden the computer graphics tools and algorithms.

• **Teaching Statement**

As a lectures, my goal is in general two-fold. First, to provide students with tools and in-depth understanding of the presented subject. Second and not less important, to awake curiosity and motivation in students as well as a sense of independence in approaching problems in computer science in general and computer graphics in particular.

Motivation

In order to inspire values of curiosity, motivation and independence in my students I encourage a dynamic dialogue in class. Questions and answers, riddles and discussion are essential keys to progress as it stimulates and encourages students to investigate the various topics. In my classes I focus on the intuition and motivation behind the problems which I teach. Since a positive atmosphere in class is essential to the learning experience, I sometime start
with historical trivia or humor before plunging into the complex material. I believe a teachers enthusiasm for a subject is contagious, and I am glad when it is passed on in class or in one-on-one conversations. I also believe that my love for research should be evident to students, as it will encourage them to follow the research path.

Understanding

To enhance the students understanding I try to found my teaching on certain principles. When explaining key algorithms and techniques I like to provide the formal arguments behind the algorithmic choices and properties. However, I usually focus on the fundamental concepts and general ideas while requesting the students to independently work on specific exercises and problems. I believe that it is much easier to understand complex concepts by grasping the general idea from a very simplified model or example. Similarly, whenever possible I prefer drawing figures and schemes rather than words. I believe that ”a picture is worth a thousand words”.
In my teaching, I try to provide many figures and examples since it typically helps students to understand and memorize the material.