

# Manolis Savva

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## Education

### Stanford University

Ph.D. in Computer Science (Thesis: Body-centric Understanding of 3D Environments)  
Conferred September 2016

### Stanford University

MS in Computer Science  
Conferred December 2012

### Cornell University

B.A. in Physics and Computer Science  
Conferred December 2009

## Refereed Publications

### Functionality Representations and Applications for Shape Analysis

Ruizhen Hu, Manolis Savva, Oliver van Kaick  
Eurographics STAR, Computer Graphics Forum 2018

### Im2Pano3D: Extrapolating 360 Structure and Semantics Beyond the Field of View

Shuran Song, Andy Zeng, Angel X. Chang, Manolis Savva, Silvio Savarese, Thomas Funkhouser  
Proceedings of CVPR 2018

### Matterport3D: Learning from RGB-D Data in Indoor Environments

A. Chang, A. Dai, T. Funkhouser, M. Halber, M. Nießner, M. Savva, S. Song, A. Zeng, Y. Zhang  
Proceedings of 3DV 2017

### Cross-modal Attribute Transfer for Rescaling 3D Models

Lin Shao, Angel X. Chang, Hao Su, Manolis Savva, Leonidas Guibas  
Proceedings of 3DV 2017

### ScanNet: Richly-annotated 3D Reconstructions of Indoor Scenes

Angela Dai, Angel X. Chang, Manolis Savva, Maciej Halber, Thomas Funkhouser, Matthias Nießner  
Proceedings of CVPR 2017

### Physically-Based Rendering for Indoor Scene Understanding Using Convolutional Neural Networks

Yinda Zhang, Shuran Song, Ersin Yumer, Manolis Savva, Joon-Young Lee, Hailin Jin, Thomas Funkhouser  
Proceedings of CVPR 2017

### Semantic Scene Completion from a Single Depth Image

Shuran Song, Fisher Yu, Andy Zeng, Angel X. Chang, Manolis Savva, Thomas Funkhouser  
Proceedings of CVPR 2017

### PiGraphs: Learning Interaction Snapshots from Observations

Manolis Savva, Angel X. Chang, Pat Hanrahan, Matthew Fisher, Matthias Nießner  
Proceedings of ACM SIGGRAPH 2016

### Activity-centric Scene Synthesis for Functional 3D Scene Modeling

Matthew Fisher, Manolis Savva, Yangyan Li, Pat Hanrahan, and Matthias Nießner  
Proceedings of ACM SIGGRAPH Asia 2015

### Text to 3D Scene Generation with Rich Lexical Grounding

Angel X. Chang, Will Monroe, Manolis Savva, Christopher Potts, and Christopher D. Manning  
Proceedings of ACL 2015

### SceneGrok: Inferring Action Maps in 3D environments

Manolis Savva, Angel X. Chang, Pat Hanrahan, Matthew Fisher, and Matthias Nießner  
Proceedings of ACM SIGGRAPH Asia 2014

### Learning Spatial Knowledge for Text to 3D Scene Generation

Angel X. Chang, Manolis Savva, and Christopher D. Manning  
Proceedings of the 2014 Conference on Empirical Methods in Natural Language Processing

### TransPhoner: Automated Mnemonic Keyword Generation

Manolis Savva, Angel X. Chang, Christopher D. Manning, and Pat Hanrahan  
Proceedings of CHI 2014

### **Example-based Synthesis of 3D Object Arrangements**

Matthew Fisher and Daniel Ritchie and Manolis Savva and Thomas Funkhouser, and Pat Hanrahan  
Proceedings of ACM SIGGRAPH Asia 2012

### **GraphPrism: Compact Visualization of Network Structure**

Sanjay Kairam, Diana MacLean, Manolis Savva, and Jeffrey Heer  
Advanced Visual Interfaces 2012

### **ReVision: Automated Classification, Analysis and Redesign of Chart Images**

Manolis Savva, Nicholas Kong, Arti Chhajta, Fei-Fei Li, Maneesh Agrawala, and Jeffrey Heer  
Proceedings of ACM UIST 2011, Notable Paper Award

### **Characterizing Structural Relationships in Scenes Using Graph Kernels**

Matthew Fisher, Manolis Savva, and Pat Hanrahan  
Proceedings of ACM SIGGRAPH 2011

### **Back-action-evading Measurements of Nanomechanical Motion**

Jared Hertzberg, Tristan Rocheleau, Tchefor Ndukum, Manolis Savva, Aashish Clerk, and Keith Schwab  
Nature Physics vol. 6, no. 3, pp. 213–217, 2009

## **Technical Reports and Preprints**

### **Text2Shape: Generating Shapes from Natural Language by Learning Joint Embeddings**

Kevin Chen, Christopher B. Choy, Manolis Savva, Angel X. Chang, Thomas Funkhouser, Silvio Savarese  
arXiv:1803.08495 [cs.CV], Mar 2018

### **MINOS: Multimodal Indoor Simulator for Navigation in Complex Environments**

Manolis Savva, Angel X. Chang, Alexey Dosovitskiy, Thomas Funkhouser, Vladlen Koltun  
arXiv:1712.03931 [cs.LG], Dec 2017

### **Learning Where to Look: Data-Driven Viewpoint Set Selection for 3D Scenes**

Kyle Genova, Manolis Savva, Angel X. Chang, Thomas Funkhouser  
arXiv:1702.04405 [cs.CV], Apr 2017

### **SceneSuggest: Context-driven 3D Scene Design**

Manolis Savva, Angel X. Chang, Maneesh Agrawala  
arXiv:1703.00061 [cs.GR], Feb 2017

### **SceneSeer: 3D Scene Design with Natural Language**

Angel X. Chang, Mihail Eric, Manolis Savva, Christopher D. Manning  
arXiv:1703.00050 [cs.GR], Feb 2017

### **ShapeNet: An Information-Rich 3D Model Repository**

Angel X. Chang, Thomas Funkhouser, Leonidas Guibas, Pat Hanrahan, Qixing Huang, Zimo Li, Silvio Savarese, Manolis Savva, Shuran Song, Hao Su, Jianxiong Xiao, Li Yi, and Fisher Yu  
arXiv:1512.03012 [cs.GR], Dec 2015

## **Workshop Papers, Tutorials, and Extended Abstracts**

### **Linking WordNet to 3D Shapes**

Angel X. Chang, Rishi Mago, Pranav Krishna, Manolis Savva, Christiane Fellbaum  
Proceedings of Global WordNet Conference 2018

### **Directions in Shape Analysis towards Functionality**

Ruizhen Hu, Oliver van Kaick, Youyi Zheng, Manolis Savva  
SIGGRAPH Asia Course, 2016

### **SHREC17 Track: Large-Scale 3D Shape Retrieval from ShapeNet Core55**

M. Savva, F. Yu, H. Su, A. Kanazaki, T. Furuya, R. Ohbuchi, Z. Zhou, R. Yu, S. Bai, X. Bai, M. Aono, A. Tatsuma, S. Thermos, A. Axenopoulos, G. Th. Papadopoulos, P. Daras, X. Deng, Z. Lian, B. Li, H. Johan, Y. Lu, S. Mk  
Eurographics Workshop on 3D Object Retrieval 2017

### **SHREC'16 Track: Large-Scale 3D Shape Retrieval from ShapeNet Core55**

M. Savva, F. Yu, H. Su, M. Aono, B. Chen, D. Cohen-Or, W. Deng, H. Su, S. Bai, X. Bai, N. Fish, J. Han, E. Kalogerakis, E. G. Learned-Miller, Y. Li, M. Liao, S. Maji, A. Tatsuma, Y. Wang, N. Zhang, Z. Zhou  
Eurographics Workshop on 3D Object Retrieval 2016

### **Semantically-Enriched 3D Models for Common-sense Knowledge**

Manolis Savva, Angel X. Chang, and Pat Hanrahan  
CVPR 2015 Vision meets Cognition Workshop

### On Being the Right Scale: Sizing Large Collections of 3D Models

Manolis Savva, Angel X. Chang, Gilbert Bernstein, Christopher D. Manning, Pat Hanrahan  
SIGGRAPH Asia 2014 Workshop on Indoor Scene Understanding: Where Graphics meets Vision

### Learning Affordance Maps by Observing Interactions

Manolis Savva, Angel X. Chang, Matthew Fisher, Matthias Nießner, and Pat Hanrahan  
CVPR 2014 Workshop on Functionality, Physics, Intentionality and Causality

### Interactive Learning of Spatial Knowledge for Text to 3D Scene Generation

Angel X. Chang, Manolis Savva, and Christopher D. Manning  
Proceedings of the ACL 2014 Workshop on Interactive Language Learning, Visualization, and Interfaces

### Semantic Parsing for Text to 3D Scene Generation

Angel X. Chang, Manolis Savva, and Christopher D. Manning  
Proceedings of the ACL 2014 Workshop on Semantic Parsing

## Invited Talks

### Embodied Agents and Environments Workshop, FAIR, Facebook

*MINOS: Multimodal Indoor Simulator*

Menlo Park, CA  
February 2018

### Visual Models Tech Talk, Google Brain, Google

*Generation of 3D Environments through Embodied Analysis and Synthesis*

Mountain View, CA  
February 2018

### Intel/NSF Visual and Experiential Computing Retreat, Intel Labs

*From Virtual to Real and Back Again*

Santa Clara, CA  
December 2017

### Visual Computing Center, Shenzhen University

*Towards Holistic 3D Scene Understanding*

Shenzhen, China  
July 2017

### Perceptual Computing Group, Intel

*Towards Holistic 3D Scene Understanding*

Jerusalem, Israel  
February 2017

### Adobe Research

*PiGraphs for Text to Interaction Snapshot Generation*

San Jose, CA  
May 2015

### Vicarious

*Common-sense Knowledge for Virtual Environments*

Union City, CA  
October 2015

### Computer Science Department, University of California, Berkeley

*Semantic Understanding of Objects, Actions, and Environments*

Berkeley, CA  
September 2014

## Employment

### Visiting Research Collaborator

*Princeton University*

Princeton, NJ  
Sep 2017 –

Mentored by Prof. Tom Funkhouser while on sabbatical at Google and Stanford. Research in 3D scene understanding and human-centric analysis of 3D environments.

### Research Engineer Contractor

*AutoRoboto LLC, on-site at Google*

Mountain View, CA  
Sep 2017 –

Mentored by Prof. Tom Funkhouser while on sabbatical at Google and Stanford. Research in 3D scene understanding and human-centric analysis of 3D environments.

### Postdoctoral Research Associate

*Princeton University*

Princeton, NJ  
Aug 2016 – Aug 2017

Mentored by Prof. Tom Funkhouser. Research in 3D scene understanding and human-centric analysis of 3D environments.

### Research Intern

*Square Enix Co., Ltd.*

Tokyo, Japan  
Fall 2013

Mentored by Remi Driancourt. Investigated geometric analysis methods for 3D model part segmentation and recombination in order to enable automated synthesis of object variations. Outcome was a prototype system and research talk to the advanced technologies division of Square Enix.

### Research Assistant

*Program of Computer Graphics, Cornell University*

Ithaca, NY  
May 2009 – May 2010

Mentored by Prof. Steve Marschner. Acquired material appearance as Bidirectional Texture Functions using gonioreflectometer experimental setup; investigated data compression and real-time rendering of captured data

### Research Assistant

*Laboratory of Atomic and Solid State Physics, Cornell University*

Ithaca, NY  
Fall 2007

Mentored by Prof. Keith Schwab. Designed, prototyped and implemented microwave cavity electromagnetic filter and cryogenic probes for achieving near absolute zero cooling of nano-mechanical resonator circuits.

## Teaching and Mentoring

<b>Teaching Fellow</b> <i>Introduction to Computer Graphics and Imaging (Stanford CS 148)</i> Instructor for course. Created lecture material, taught lectures, designed and graded assignments and exams	Stanford, CA Summer 2015
<b>Research Mentor</b> <i>Stanford RA and CURIS Programs</i> Mentored two masters students in their research assistantships and four undergraduate students as part of the Stanford CS Undergraduate Research Internship program. Students contributed significantly to active research projects	Stanford, CA 2013 – 2016
<b>Course Assistant</b> <i>Introduction to Computer Graphics and Imaging (Stanford CS 148)</i> Advised students in office hours, designed and graded exams and programming assignments, gave guest lectures	Stanford, CA Summer 2011
<b>Teaching Assistant</b> <i>Introduction to Scientific Computing (Cornell CS 3220)</i> Advised students in office hours, designed and graded exams and programming assignments	Ithaca, NY Spring 2010
<b>Teaching Assistant</b> <i>Introduction to Computer Graphics (Cornell CS 4620)</i> Advised students in office hours, graded exams and programming assignments	Ithaca, NY Fall 2009

## Service

**Reviewer:** CoRL, CVPR, CHI, EuroGraphics, SIGGRAPH, SIGGRAPH Asia, SMI, TVCG, UIST  
**Workshop Organizer:** ICCV 2017 workshop on Learning to See from 3D Data, Eurographics 3DOR 2016/2017 SHREC Track — Large-scale 3D Shape Retrieval from ShapeNet Core55  
**Research Seminar Organizer:** Started “Semantics and Geometry” weekly seminar at Stanford to facilitate interdisciplinary research communication (2014-2016); Organized Stanford graphics lab GCafe lunch talk series (2014-2016)

## Skills

**Languages:** Modern Greek and Bulgarian (native tongues), English (fluent), Japanese (advanced proficiency), Mandarin (intermediate proficiency), German (basic proficiency)  
**Martial Arts:** practitioner of Aikido, served as president of Cornell Aikido Club for 4 years

## Honors and Awards

Stanford Graduate Fellowship 2012-2015  
ACM UIST Notable Paper Award (for ReVision paper, at UIST 2011)  
Stanford School of Engineering Akiko Yamazaki and Jerry Yang Engineering Fellowship 2010-2011  
CASP–Fulbright undergraduate scholarship (US–Cyprus exchange student scholarship, 2005-2009)  
Undergraduate Teaching Assistant Excellence Award (Computer Science Department, Cornell University, 2009)  
Distinguished Leadership Award for Aikido Club presidentship (Cornell Student Activities Office, 2009)  
Robert J. Smith award for most promising student of Japanese (Asian Studies Department, Cornell University, 2006)  
Highest international score award for GCE A–Level Physics Advanced Extension (administered by Edexcel, 2003)  
Graduating class valedictorian (2003 class of American Academy Larnaca, Cyprus)

## References

**Pat Hanrahan**  
Canon USA Professor of Computer Science  
hanrahan@cs.stanford.edu

**Thomas Funkhouser**  
Professor of Computer Science  
funk@cs.princeton.edu

**Leonidas J. Guibas**  
Paul Pigott Professor of Computer Science and Electrical Engineering  
guibas@cs.stanford.edu

**Niloy Mitra**  
Professor  
n.mitra@cs.ucl.ac.uk

**Silvio Savarese**  
Associate Professor  
ssilvio@stanford.edu