

# COREY TOLER-FRANKLIN

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## EDUCATION

- Princeton University, Computer Science Department** 2011  
*Ph.D., Computer Science*  
*Research Areas:* Computer Graphics and Computer Vision  
*Topics:* Acquisition and analysis of the shape and appearance of real-world objects. Algorithms for processing and visualizing complex datasets including matching and non-photorealistic rendering.  
*Thesis:* *Matching, Visualizing and Archiving Cultural Heritage Artifacts Using Multi-Channel Images*  
*Teaching:* COS 126 General Computer Science, COS 226 Algorithms and Data Structures  
*Advisor:* Dr. Szymon Rusinkiewicz
- Cornell University, Program of Computer Graphics** 1999  
*M.S., Architecture, Major: Computer Graphics*  
*Research Areas:* Conceptual modeling tools for architectural design  
*Topics:* Developed a visualization system to teach the mathematical concepts behind projective geometry. Introduced software and novel digital rear-projected display systems to architecture students at Cornell.  
*Thesis:* *A Computer-Based Approach for Teaching Architectural Drawing*  
*Teaching:* Introduced architecture students to computer graphics in a novel design studio.  
*Advisor:* Dr. Donald Greenberg
- Cornell University, College of Architecture, Art and Planning** 1997  
*B.Arch (Class Rank 4 out of 21)*  
*Thesis:* *On Site Museum of Oral History, Nassau, Bahamas*
- Cornell Abroad:** Studied significant architectural works and cultures in Italy, Africa and Malta 1995

## PROFESSIONAL EXPERIENCE

- Columbia University, Barnard College** Jan. 2024 - present  
Assistant Professor, Computer Science  
Director, Graphics Imaging & Light Measurement Laboratory (GILMLab)
- University of Florida Gainesville, Computer & Information Science & Engineering Dept.** Sept. 2014 – Jul. 2023  
Assistant Professor, Computer Science  
Director, Graphics Imaging & Light Measurement Laboratory (GILMLab)
- Florida Museum of Natural History, Department of Natural History, Gainesville, FL** Sept. 2015 - present  
Affiliate Assistant Professor
- American Museum of Natural History, Division of Anthropology, NY, NY** Sept. 2015 - present  
Research Associate
- University of California Davis, Computer Science Department, Davis, CA** July 2012 – July 2014  
UC President's Postdoctoral Fellow
- University of California Berkeley, CITRIS Banatao Institute, Berkeley, CA** July 2012 – July 2014  
Affiliated Researcher
- Yale University, Computer Science Department, New Haven, CT** July 2011 – July 2012  
Yale Postdoctoral Fellow - Working with Professor Holly Rushmeier
- Adobe Systems, Advanced Technology Labs, San Jose, CA** Summer 2007  
Computer Vision Group – Developed system for creating computer-generated mosaics.
- Google Inc., Boulder, Colorado** Summer 2006  
Google SketchUp Team – Developed prototype for controlling line density in SketchUp models.
- Autodesk Inc., San Francisco, CA** March 2000 – March 2004  
Software Engineer – 3D Graphics System Team  
Implemented platform enhancements to 3D graphics system; Developed 3D navigation and rendering tools, and 3<sup>rd</sup> party APIs; Notable contributions to AutoCAD 2002, 2004, 2005: 3D Graphics Configuration, True Color Support, Shaded Viewport Plotting, 3D Navigation Tools, Microsoft Windows Logo Certification, and Sheet Set Management.
- Special Project - Strategic Accounts:* Led pilot project between Autodesk executives and two international architecture firms - HOK and Gensler; Consulted on-site at firms to develop and integrate new technologies.

Software Engineer/Project Architect

Led collaborative Design-Assist project to integrate Building Information Modeling Technology into the design process to estimate construction time/cost: Projects - Camino Medical Group Campus, Palo Alto Medical Facility.

**RESEARCH SOFTWARE DEVELOPED****iDigFossils App**- Developed 3D visualization app for interpreting fossils to teach STEM concepts in middle schools.**RGBNMatch** - Developed hardware and software for data capture, normal reconstruction and computer assisted matching. Deployed system on-site at the Akrotiri Excavation Laboratory of Wall Paintings, Santorini, Greece**RGBNRender** - Developed system for generating scientific visualizations of surface details on real-world objects.**HONORS**

Google Anita Borg Scholarship for Women in Computer Science: Finalist	2009
Autodesk 2002 Software Developer Award	2002
Shreve Award: MS Thesis Project - For excellence and originality	1999
The Eschweiler Prize: Recognized for outstanding academic accomplishments	1997

**SPONSERED RESEARCH**

Vagelos Computational Science Center (CSC), Computing Resource Mini-Grant \$2000.00, PI	2024
Activision, Graphics Department, Microsoft Gaming Grant, PI	2024
UF Informatics Institute Seed Fund Focus on AI, \$39,960.00, 08/03/2021- 08/03/2022, Co-PI	2021
UF Artificial Intelligence Research Catalyst Fund HiPerGator Resources 12/15/2020-12/15/2021, Co-PI	2020
NSF iTest Award (#1510410), \$1,194,054.00, 02/11/2016 - 12/30/2021, Co-PI	2016
NSF iDigBio Visiting Scholar Award	2013
University of California President's Postdoctoral Fellowship, PI Corey Toler-Franklin	2012 - 2014
National Science Foundation (NSF) Graduate Research Fellowship	2005-200
Presidential Fellowship, Princeton University	2005-2009
Merit Award, Princeton University	2005-2009
Robert James Eidlitz Traveling Fellowship	1998

**SELECTED PUBLICATIONS****CNN-Based Action Recognition and Pose Estimation for Classifying Animal Behavior from Videos: A Survey**Michael Perez, Corey Toler-Franklin. *arXiv:2301.06187*. 2023 January <https://doi.org/10.48550/arXiv.2301.06187>**3-D Material Style Transfer for Reconstructing Unknown Appearance in Complex Natural Materials**Shashank Ranjan, Corey Toler-Franklin. *arXiv:2112.15589*. 2021 December; <https://arxiv.org/abs/2112.15589>**Non-Photorealistic Rendering of Layered Materials: A Multispectral Approach**Corey Toler-Franklin, Shashank Ranjan. *arXiv:2109.00780*. 2021 September; <https://arxiv.org/abs/2109.00780>**Multiscale Detection of Cancerous Tissue in High Resolution Slide Scans**

Qingchao Zhang, Coy D. Heldermon, Corey Toler-Franklin.

*Advances in Visual Computing. ISVC 2020. Lecture Notes in Computer Science. 2020 October;*[https://doi.org/10.1007/978-3-030-64559-5\\_11](https://doi.org/10.1007/978-3-030-64559-5_11)**Learning How to Match Fresco Fragments**

Thomas Funkhouser, Hijung Shin, Corey Toler-Franklin, Antonio Garcia Castaneda, Benedict Brown, David Dobkin, Szymon Rusinkiewicz, Tim Weyrich.

*Journal on Computing and Cultural Heritage* 4(2), November 2011.<https://doi.org/10.1145/2037820.2037824>**Learning How to Match Fresco Fragments**

Thomas Funkhouser, Hijung Shin, Corey Toler-Franklin, Antonio Garcia Castaneda, Benedict Brown, David Dobkin, Szymon Rusinkiewicz, Tim Weyrich.

*Eurographics 2011 Special Area Track on Cultural Heritage, Llandudno, UK, April 2011*<http://dx.doi.org/10.2312/EG2011/areas/017-024>**Multi-Feature Matching of Fresco Fragments**

Corey Toler-Franklin, Benedict Brown, Tim Weyrich, Thomas Funkhouser, Szymon Rusinkiewicz.

*ACM Transactions on Graphics (Proc. SIGGRAPH Asia), Seoul, Korea, December 2010.*<https://doi.org/10.1145/1882261.1866207>

**A System for High-Volume Acquisition and Matching of Fresco Fragments: Reassembling Thera Wall Paintings:** Benedict Brown, Corey Toler-Franklin, Diego Nehab, Michael Burns, Andreas Vlachopoulos, Christos Doumas, David Dobkin, Szymon Rusinkiewicz, Tim Weyrich.  
*ACM Transactions on Graphics (Proc. SIGGRAPH), Los Angeles, CA, August, 2008.*  
<https://doi.org/10.1145/1360612.1360683>

**Illustration of Complex Real-World Objects using Images with Normals.**  
Corey Toler-Franklin, Adam Finkelstein, and Szymon Rusinkiewicz.  
*International Symposium on Non-Photorealistic Animation and Rendering (NPAR) San Diego, CA, August 2007*  
<https://doi.org/10.1145/1274871.1274889>

#### **Courses/Tutorials**

**Principles and Practices of Robust, Photography-based Digital Imaging Techniques for Museums:**  
Co-presented full day course. Presented acquisition and rendering algorithms for museum conservation.  
VAST 11<sup>th</sup> International Symposium on Virtual Reality, Archaeology and Cultural Heritage  
(Proc. EUROGRAPHICS 2010), Palais du Louvre, Paris, France, September 2010.  
<http://dx.doi.org/10.2312/PE/VAST/VAST10S/111-137>

#### **TEXTBOOK CHAPTERS**

Blackwell Companions to Anthropology: A Companion to Rock Art  
*Chapter 14: Rock art as digital heritage: advances in photo enhancement technology and digital archiving* Ruth Tringham, Michael Ashley and Cinzia Perlingieri (University of California, Berkeley), Liam Brady (University of Western Australia), Mark Mudge, Tommy Noble, Neffra Matthews, Szymon Rusinkiewicz, Corey Toler-Franklin and Carla Schroer (Cultural Heritage Imaging, Princeton University), Wiley Publishing 2012.

#### **INVITED TALKS/WORKSHOPS**

**Princeton University, School of Engineering and Applied Science, February 27, 2024**  
Technology for Social Change, Friend Center Convocation Room.

**UT Southwestern Medical Center, Computational Biology Seminar Series,  
Department of Bioinformatics November 27<sup>th</sup> 2023**  
Multispectral Analysis and Deep Learning for Life Science and Biomedical Research

**UT Southwestern Medical Center, Computational Biology Seminar Series,  
Department of Bioinformatics November 27<sup>th</sup> 2023**  
Multispectral Analysis and Deep Learning for Life Science and Biomedical Research

**University of South Florida, Physics Department, Fall 2023 Colloquium, September 13<sup>th</sup>, 2023**  
Multispectral Analysis and Deep Learning for Life Science and Biomedical Research

**Purdue University, Conference for African-American Researchers in the Mathematical Sciences, July 2023**  
Multispectral Analysis and Deep Learning for Life Science and Biomedical Research

**Sorbonne Center for Artificial Intelligence (SCAI), Sorbonne Université, Paris, France, June 2023**  
Fostering Collaborative Breakthroughs in Heritage Science Through Machine Learning and Data Science

**Rochester Institute of Technology, Center for Imaging Science, Rochester, New York  
November 16<sup>th</sup>, 2022** Multispectral Analysis and Deep Learning for Life Science and Biomedical Research

**College of Medicine, University of Florida, March 2022**  
Artificial Intelligence and The Future of Medicine

**C. A. Pound Human Identification Forensics Laboratory, University of Florida, May 1, 2021**  
Deep Learning Applications for Material Identification in Forensic Science

**Department of Neuroscience, College of Medicine, University of Florida, April 29, 2021**  
Deep Learning Algorithms for Improving Efficacy and Reproducibility in Animal Behavioral Studies

**College of Medicine, University of Florida, April 2021**  
Artificial Intelligence and The Future of Medicine

**International Symposium on Visual Computing (ISVC), San Diego, CA., October 2020**  
Multiscale Detection of Cancerous Tissue in High Resolution Slide Scans

**College of Medicine, University of Florida, April 2020**  
Artificial Intelligence and The Future of Medicine

**C.A. Pound Human Identification Laboratory, University of Florida, October 2019**  
Multispectral Analysis Algorithms for Life Science Research

**American Museum of Natural History, New York, New York, November 1<sup>st</sup>, 2018**  
Optical Imaging Systems for Simulating Biological Material Structures

**McKnight Brain Institute, University of Florida College of Medicine, Gainesville, FL, November 16<sup>th</sup>, 2018**  
Harnessing Pattern Detection and Deep Learning Algorithms to Improve Efficiency, Accuracy and Throughput of Animal Behavior Studies

**Savannah's Tech and Innovation Showcase, The Guild Hall, Savannah Georgia, February 2<sup>nd</sup>, 2018**  
Med Tech Innovations: Current and Future Trends

**NYCEP (the New York Consortium in Evolutionary Primatology)  
and the Richard Gilder Graduate School at the American Museum of Natural History  
New York, New York, March 2016, 3D Multi-Spectral Imaging & Analysis Methods for Applications in  
Biodiversity & Cultural Heritage Preservation**

**Yale University, Computer Science Department & Center for the Preservation of Cultural Heritage**  
New Haven, Connecticut March 2016, 3D Imaging & Analysis Methods for Applications in Biodiversity

**University of California San Diego, Conference for African American Researchers in the Mathematical  
Sciences, San Diego, CA, July 2013, Multi-Spectral Imaging Techniques for Analyzing Biological Specimens**

**University of Florida iDigBio HUB, Gainesville, Florida, February 2013**  
Data Capture and Analysis of Artifacts and Biological Specimens Using Multi-Channel Images

**The National Evolutionary Synthesis Center, Duke University, Durham, North Carolina, February 2013**  
Multi-Spectral Imaging Techniques for Analyzing Biological Specimens

**Lehman College CUNY Computer Science Department, Bronx, New York, February 2013**  
Analyzing Biological Specimens Using Multi-Spectral Images

**University of California Berkeley, The CITRIS Banatao Institute, Berkeley, California, September 2012**  
Research Exchange Series: Matching, Visualizing, and Archiving Artifacts Using Multi-Channel Images

**The American Museum of Natural History (AMNH), New York, New York, June 2012**  
Data Acquisition Techniques for Documenting and Analyzing Biological Specimens

**Yale University Computer Science Department, New Haven CT, June 2012**  
Matching, Visualizing and Archiving Cultural Heritage Artifacts Using Multi-Channel Images

**Yale University, Peabody Museum, SPNHC 27th Annual meeting, New Haven, CT, June 2012**  
Digitizing the Thera Frescoes : Practical 3D acquisition methods for museum conservation

**Adobe Systems, Inc., Advanced Technologies Lab, San Francisco, California, May 2012.**  
Matching, Visualizing and Archiving Cultural Heritage Artifacts Using Multi-Channel Images

**University of California Berkeley Computer Science Department, Berkeley, California, October 2011**  
Visual Computing Lab Talk: Computer Graphics and Computer Vision Techniques for Preserving Artifacts

**Akrotiri Excavation Laboratory of Wall Paintings, Santorini, Greece, July 2009, July 2010, July 2011**  
Summer Workshop Session: A Matching System for Reassembling the Thera Frescos

**University of Oxford, Oxford, United Kingdom, February 2011**  
RTISAD Oxford Workshop: Digital Transformations: New developments in cultural heritage imaging

**University of California Los Angeles Math Department, Los Angeles, California, January 2011**  
Guest Lecturer: Applied Math/Image Processing Seminar: Pattern Matching Algorithms and Reassembly Systems

**Hewlett Packard Laboratories Palo Alto, California, January 2011**  
Technical Talk Series: Computer Graphics for Cultural Heritage Preservation

**University of Southern California, Los Angeles, California January 2011**  
Computer Graphics Techniques for Digitizing and Visualizing Artifacts

**Rochester Institute of Technology, Center for Imaging Science, Rochester, New York, October 2010**  
Colloquium Talk: Matching, Visualizing and Analyzing Artifacts Using Multi-Channel Images

**The Museum of Modern Art (MoMA) Conservation Department, New York, New York, July 2010**  
Generating Scientific Illustrations using Non-Photorealistic Rendering

**Adobe Systems, Inc., San Jose, California, August 2007**

Non-Photorealistic Illustration using RGBN Images

**Google Inc., Boulder Colorado, August 2006**

Google Tech Talk Series: A Prototype for Controlling Line Density in 3D Models

## **TEACHING EXPERIENCE**

Deep Learning for Computer Graphics, Columbia University, Barnard College, COMS BC3997 Sec.003 Spring 2024

Deep Learning for Computer Graphics, University of Florida CAP5404, Fall 2022  
Introduced new graduate-level AI course in the Florida State-Wide Numbering System

Deep Learning for Computer Graphics, University of Florida CAP4613, Spring 2022  
Introduced new undergraduate-level AI course in the Florida State-Wide Numbering System

Introduction to Medical Science Seminar 1 (Translational Neuroscience),  
University of Florida MDU4001, Spring 2020, Spring 2021, Spring 2022, Spring 2023  
Co-Teach course for honors students, University of Florida College of Medicine

Special Topics, Deep Learning for Computer Graphics,  
University of Florida CIS6930/4930, Fall 2020, Spring 2021, Fall 2021  
Undergraduate and graduate co-listed course: special topics in computer science

Computational Structures in Computer Graphics,  
University of Florida CAP4730, Spring 2017, Fall 2018, Spring 2019  
Undergraduate course

Advanced Computer Graphics, University of Florida CAP6701, Spring 2016, Spring 2018  
Graduate course

Computer Graphics, University of Florida CAP5705, Fall 2015, Fall 2017  
Graduate course

Special Topics, 3D Imaging & Visualization in Computer Graphics,  
University of Florida CIS 6930/4930, Spring 2015  
Undergraduate and graduate co-listed course: special topics in computer science

## **GRADUATE STUDENT ADVISING**

### **Chair - Ph.D Thesis Committees**

Aashish Dhwan, Computer Science, University of Florida, Expected Graduation May 2027  
Michael Perez, Computer Science, University of Florida, Expected Graduation May 2026  
Shashank Ranjan, Computer Science, University of Florida, Graduated May 2020  
Qile Zhu, Computer Science, University of Florida, (Advised 2015-2016)

### **Member - Ph.D Thesis Committees**

Ethan Wilson, Computer Engineering, University of Florida, Expected Graduation May 2026  
Jennifer Cremer, Computer Science, University of Florida, Expected Graduation, May 2025  
Sara Pickernell, Psychology, University of Florida, Expected Graduation May 2025  
Sydney Lower, Physics, University of Florida, Expected Graduation May 2024  
Jeremy Youngquist, Computer Science, University of Florida, Graduated, May 2024  
Ruiliang Gao, Computer Engineering, University of Florida, Graduated May 2024  
Brendan David-John, Computer Science, University of Florida, (Advised 2018-2020)  
Ronald Wilson, Electrical & Computer Engineering, University of Florida, Graduated June 2021  
Icaro Alzuru, Computer Engineering, University of Florida, Graduated May 2020  
Hao Gan, Agricultural & Biological Engineering, University of Florida, Graduated December 2018  
Daeun Choi, Agricultural & Biological Engineering, University of Florida, Graduated August 2017  
Michael Borish, Computer Science, University of Florida, Graduated December 2016

### **Chair - M.S. Thesis Committee**

Tan Manh Nguyen, Computer Science, Columbia University, Expected Graduation, May 2025  
Daniel Quintero, Computer Science, University of Florida, Graduated December 2021  
Manjog Singh, Computer Science, University of Florida, Graduated December 2021  
Shashank Ranjan, Computer Science, University of Florida, Graduated August 2016

### **Chair - M.S. Project Committee**

Utkarsh Garg, Computer Science, University of Florida, Graduated August 2016  
Qile Zhu, Computer Science, University of Florida, Graduated August 2015

## **UNDERGRADUATE STUDENT ADVISING**

Advise numerous undergraduate thesis projects, senior projects and independent studies,  
Columbia University 2024-present, University of Florida 2015-2023

## **PROFESSIONAL ACTIVITIES**

### **Memberships**

Association for Computing Machinery (ACM)  
European Association for Computer Graphics (EG)  
IEEE Computer Society  
National Society of Black Engineers (NESBE)  
American Institute of Architects (AIA)  
National Organization of Minority Architects (NOMA)  
Wesley L. Harris Scientific Society (Founding Member), Princeton, University (WLHSS)

### **Technical Program Committees, Editorial Boards and Grant Review Panels**

MIT Press, Computer Science Division, Reviewer 2022 - present  
ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games 2021-present  
Euroviz 2021-present  
Quantitative InfraRed Thermography Journal 2019-present  
International Conferences in Central Europe on Computer Graphics, Visualization and Computer Vision (WSCG) 2019-present  
An International Journal of Systems & Applications in Computer Graphics 2017-present  
Computers & Graphics, by Elsevier Editorial Publishing, 2017-present  
IEEE International Conference on Virtual Systems and Multimedia (VSMM), 2016-present  
IEE International Conference on Virtual Systems & Multimedia (VSMM) 2016-present  
Eurographics Workshop on Graphics and Cultural Heritage (GCH), 2014-present  
ACM Journal on Computing and Cultural Heritage (JOCCH), 2013 - present  
International Symposium on Virtual Reality, Archaeology and Cultural Heritage, VAST 2010, 2011, 2013  
Digital Heritage 2013 (Under the patronage of UNESCO), International Congress 2013  
Eurographics International Scientific Committee 2010-present  
NSF Panel Reviewer 2015-present: Small Business Technology Transfer (STTR), Small Business Innovation Research (SBIR), Information and Intelligent Systems (IIS),  
Established Program to Stimulate Competitive Research (EPSCoR)

### **University Governance and Service**

Columbia CS DEI action committee 2024 - present  
University of Florida, CISE Graduate Admissions Committee, 2020-present  
University of Florida, Colloquium Committee, 2019-2020  
University of Florida, Department of Computer Science Curriculum Committee, 2015-2018  
University of Florida, Graduate Marshal Committee, 2014-present

## **OTHER SERVICE**

Barnard Center for Research on Women (BCRW), Advisory Board (2023 – present)  
Princeton University Research Day Judge (2023)  
Princeton Graduate Mentorship Program (2023 – present)  
Women in Science and Engineering at Princeton Focus Group (2009-present)  
Autodesk Design Your Future Program for Women in Science and Technology (2000-2004)