Stanford



Maneesh Agrawala

Forest Baskett Professor and Professor, by courtesy, of Electrical Engineering

Computer Science

CONTACT INFORMATION

- **Administrative Contact**

  Andrea Brand-Sanchez

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Bio

BIO

Maneesh Agrawala is the Forest Baskett Professor of Computer Science and Director of the Brown Institute for Media Innovation at Stanford University. He was previously a Professor of Electrical Engineering and Computer Science at the University of California, Berkeley (2005 - 2015). He works on computer graphics, human computer interaction and visualization. His focus is on investigating how cognitive design principles can be used to improve the effectiveness of audio/visual media. The goals of this work are to discover the design principles and then instantiate them in both interactive and automated design tools. He received an Okawa Foundation Research Grant in 2006, an Alfred P. Sloan Foundation Fellowship and an NSF CAREER Award in 2007, a SIGGRAPH Significant New Researcher Award in 2008, and a MacArthur Foundation Fellowship in 2009.

ACADEMIC APPOINTMENTS

- Professor, Computer Science
- Professor (By courtesy), Electrical Engineering
- Faculty Affiliate, Institute for Human-Centered Artificial Intelligence (HAI)

ADMINISTRATIVE APPOINTMENTS

- Director, David and Helen Gurley Brown Institute for Media Innovation, (2015- present)
- Professor, Computer Science, (2015- present)

HONORS AND AWARDS

- Research Grant, Okawa Foundation (2006)
- CAREER Award, National Science Foundation (2007)
- Research Fellow, Alfred P. Sloan Foundation (2007)
- Significant New Researcher Award, ACM SIGGRAPH (2008)
- Fellow, MacArthur Foundation (2009)
- SIGCHI Academy, ACM SIGCHI (2021)
- ACM Fellow, ACM (2022)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Advisor, Human Computation Journal (2013 - present)
- Science and Creativity Advisor, Studio 360 with Kurt Andersen (2012 - present)

PROGRAM AFFILIATIONS

- Symbolic Systems Program

PROFESSIONAL EDUCATION

- Ph.D., Stanford University , Computer Science (2002)
- B.S., Stanford University , Mathematics (1994)

LINKS

- Website at Stanford: http://graphics.stanford.edu/~maneesh
- Old UC Berkeley website: http://vis.berkeley.edu/~maneesh

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Computer Graphics, Human Computer Interaction and Visualization.

Teaching

COURSES

2026-27

- Data Visualization: CS 448B (Aut)
- Exploring Computational Journalism: COMM 281, CS 206 (Spr)

2025-26

- Data Visualization: CS 448B (Aut)
- Exploring Computational Journalism: COMM 281, CS 206 (Win)
- Human-Computer Interaction: Foundations and Frontiers: CS 347 (Spr)

2024-25

- Data Visualization: CS 448B (Aut)
- Exploring Computational Journalism: COMM 281, CS 206 (Win)

2023-24

- Data Visualization: CS 448B (Aut)
- Exploring Computational Journalism: COMM 281, CS 206 (Win)
- Human-Computer Interaction: Foundations and Frontiers: CS 347 (Spr)

STANFORD ADVISEES

Avery Louis

Postdoctoral Faculty Sponsor

Abe Davis, Kenny Jones, Chuan Yan

Orals Evaluator

Sarah Jobalia, Sharon Zhang, Ivmin Zhang

Doctoral Dissertation Advisor (AC)

Sharon Zhang, Ivmin Zhang

Master's Program Advisor

Justine Breuch

Doctoral Dissertation Co-Advisor (AC)

Matt Caren, Jihyeon Je, Nicholas Jennings

Doctoral (Program)

Jean-Peïc Chou, Jiaju Ma, Mia Tang, Chong Zeng, Sharon Zhang, Ivmin Zhang

Publications

PUBLICATIONS

- **Kinematic Kitbashing**
  Guo, M., Zordan, V., Andrews, S., Matusik, W., Agrawala, M., Liu, H., ACM
  ASSOC COMPUTING MACHINERY.2026
- **RenderFormer-V2: Neural Rendering with Heterogeneous Scene Primitives**
  Zeng, C., Dong, Y., Peers, P., Zhang, L., Agrawala, M.
  edited by Favaro, P., Favaro, Z., Maki, A., Rohrbach, A., Schindler, K., Tombari, F.
  SPRINGER INTERNATIONAL PUBLISHING AG.2026: 485-502
- **Ring Forcing: Towards Precise Long-Term Memory for Autoregressive Video Diffusion**
  Xue, B., Feng, B. Y., Lin, C., Lin, Y., Zeng, Y., Zhang, L., Agrawala, M., Yan, H., Pan, P.
  edited by Favaro, P., Kukelova, Z., Maki, A., Rohrbach, A., Schindler, K., Tombari, F.
  SPRINGER INTERNATIONAL PUBLISHING AG.2026: 225-242
- **SimStep: Human-in-the-Loop Authoring of Interactive Educational Simulations Through Task-Level Abstractions**
  Kaputa, Z., Rajaram, A., Feliciano, V., Lyu, Z., Agrawala, M., Subramonyam, H., ACM
  ASSOC COMPUTING MACHINERY.2026
- **Teaching Spell Checkers to Teach: Pedagogical Program Synthesis for Interactive Learning**
  Siddiqui, M. N., Cavez, V., Rangasrinivasan, S., Olszewski, A., Setlur, S., Agrawala, M., Subramonyam, H., ACM
  ASSOC COMPUTING MACHINERY.2026: 1322-1339
- **CubePart: An Open-Vocabulary Part-Controllable 3D Generator**
  Zhu, Y., Deng, K., Fauconnier, J., Navarro, I., Li, D., Pun, A., Zhang, Y., Zhuang, P., Sun, X., Agrawala, M., Bhat, K., Zhou, T., ACM
  ASSOC COMPUTING MACHINERY.2026
- **MoVer: Motion Verification for Motion Graphics Animations** *ACM TRANSACTIONS ON GRAPHICS*
  Ma, J., Agrawala, M.
  2025; 44 (4)
- **Generating Past and Future in Digital Painting Processes** *ACM TRANSACTIONS ON GRAPHICS*
  Zhang, L., Yan, C., Guo, Y., Xing, J., Agrawala, M.
  2025; 44 (4)
- **FlashTex: Fast Relightable Mesh Texturing with LightControlNet**
  Deng, K., Omernick, T., Weiss, A., Ramanan, D., Zhu, J., Zhou, T., Agrawala, M.
  edited by Ricci, E., Leonardis, A., Roth, S., Russakovsky, O., Sattler, T., Varol, G.
  SPRINGER INTERNATIONAL PUBLISHING AG.2025: 90-107
- **CineVision: An Interactive Pre-visualization Storyboard System for Director-Cinematographer Collaboration**

Wei, Z., Wu, H., Zhang, L., Xu, X., Zheng, Y., Hui, P., Agrawala, M., Qu, H., Rao, A., ACM
ASSOC COMPUTING MACHINERY.2025

- **Instance Segmentation of Scene Sketches Using Natural Image Priors**
  Tang, M., Vinker, Y., Yan, C., Zhang, L., Agrawala, M.
  edited by Spencer, S. N.
  ASSOC COMPUTING MACHINERY.2025

- **Keyframe-Guided Creative Video Inpainting**
  Guo, Y., Yang, C., Rao, A., Meng, C., Bar-Ta, O., Ding, S., Agrawala, M., Lin, D., Dai, B., IEEE COMPUTER SOC
  IEEE COMPUTER SOC.2025: 13009-13020

- **SparseCtrl: Adding Sparse Controls to Text-to-Video Diffusion Models**
  Guo, Y., Yang, C., Rao, A., Agrawala, M., Lin, D., Dai, B.
  edited by Leonardis, A., Ricci, E., Roth, S., Russakovsky, O., Sattler, T., Varol, G.
  SPRINGER INTERNATIONAL PUBLISHING AG.2025: 330-348

- **Transparent Image Layer Diffusion using Latent Transparency** *ACM TRANSACTIONS ON GRAPHICS*
  Zhang, L., Agrawala, M.
  2024; 43 (4)

- **A Unified Differentiable Boolean Operator with Fuzzy Logic**
  Liu, H., Agrawala, M., Yuksel, C., Omernick, T., Misra, V., Corazza, S., McGuire, M., Zordan, V., Spencer, S.
  ASSOC COMPUTING MACHINERY.2024

- **STIVi: Turning Perspective Sketching Videos into Interactive Tutorials**
  Nghiem, C., Bousseau, A., Sypesteyn, M., Hoftijzer, J., Agrawala, M., Tsandilas, T., ACM
  ASSOC COMPUTING MACHINERY.2024

- **Bridging the Gulf of Envisioning: Cognitive Challenges in Prompt Based Interactions with LLMs**
  Subramonyam, H., Pea, R., Pondoc, C., Agrawala, M., Seifert, C., ACM
  ASSOC COMPUTING MACHINERY.2024

- **ScriptViz: A Visualization Tool to Aid Scriptwriting based on a Large Movie Database**
  Rao, A., Chou, J., Agrawala, M., ACM
  ASSOC COMPUTING MACHINERY.2024

- **Block and Detail: Scaffolding Sketch-to-Image Generation**
  Sarukkai, V., Yuan, S., Tang, M., Agrawala, M., Fatahalian, K., ACM
  ASSOC COMPUTING MACHINERY.2024

- **Editing Motion Graphics Video via Motion Vectorization and Transformation** *ACM TRANSACTIONS ON GRAPHICS*
  Zhang, S., Ma, J., Wu, J., Ritchie, D., Agrawala, M.
  2023; 42 (6)

- **EMPHASISCHECKER: A Tool for Guiding Chart and Caption Emphasis.** *IEEE transactions on visualization and computer graphics*
  Kim, D. H., Choi, S., Kim, J., Setlur, V., Agrawala, M.
  2023; PP

- **Adding Conditional Control to Text-to-Image Diffusion Models** *IEEE/CVF International Conference on Computer Vision (ICCV)*
  Zhang, L., Rao, A., Agrawala, M.
  2023

- **SlideSpecs: Automatic and Interactive Presentation Feedback Collation**
  Warner, J., Pavel, A., Nguyen, T., Agrawala, M., Hartmann, B., ACM
  ASSOC COMPUTING MACHINERY.2023: 695-709

- **Tree-Structured Shading Decomposition**
  Geng, C., Yu, H., Zhang, S., Agrawala, M., Wu, J., IEEE
  IEEE COMPUTER SOC.2023: 488-498

- **ZoomShop: Depth-Aware Editing of Photographic Composition**
  Liu, S. J., Agrawala, M., DiVerdi, S., Hertzmann, A.
  WILEY.2022: 57-70

- **Modular Information Flow through Ownership**
  Crichton, W., Patrignani, M., Agrawala, M., Hanrahan, P.
  edited by Jhala, R., Dillig
  ASSOC COMPUTING MACHINERY.2022: 1-14

- **Disentangled3D: Learning a 3D Generative Model with Disentangled Geometry and Appearance from Monocular Images**
  Tewari, A., Mallikarjun, B. R., Pan, X., Fried, O., Agrawala, M., Theobalt, C., IEEE COMP SOC
  IEEE COMPUTER SOC.2022: 1506-1515

- **Measuring Compositional Consistency for Video Question Answering**
  Gandhi, M., Gul, M., Prakash, E., Grunde-McLaughlin, M., Krishna, R., Agrawala, M., IEEE COMP SOC
  IEEE COMPUTER SOC.2022: 5036-5045

- **Sketch-Based Design of Foundation Paper Pieceable Qilts**
  Leake, M., Bernstein, G., Agrawala, M., ACM
  ASSOC COMPUTING MACHINERY.2022

- **A Mathematical Foundation for Foundation Paper Pieceable Quilts** *ACM TRANSACTIONS ON GRAPHICS*
  Leake, M., Bernstein, G., Davis, A., Agrawala, M.
  2021; 40 (4)

- **Vid2Player: Controllable Video Sprites That Behave and Appear Like Professional Tennis Players** *ACM TRANSACTIONS ON GRAPHICS*
  Zhang, H., Sciutto, C., Agrawala, M., Fatahalian, K.
  2021; 40 (3)

- **Iterative Text-Based Editing of Talking-Heads Using Neural Retargeting** *ACM TRANSACTIONS ON GRAPHICS*
  Yao, X., Fried, O., Fatahalian, K., Agrawala, M.
  2021; 40 (3)

- **EVALUATING FACIAL RECOGNITION TECHNOLOGY: A PROTOCOL FOR PERFORMANCE ASSESSMENT IN NEW DOMAINS** *DENVER LAW REVIEW*
  Ho, D. E., Black, E., Agrawala, M., Li Fei-Fei
  2021; 98 (4): 753-773

- **The Role of Working Memory in Program Tracing**
  Crichton, W., Agrawala, M., Hanrahan, P., ASSOC COMP MACHINERY
  ASSOC COMPUTING MACHINERY.2021

- **Analysis of Faces in a Decade of US Cable TV News**
  Hong, J., Crichton, W., Zhang, H., Fu, D. Y., Ritchie, J., Barenholtz, J., Hannel, B., Yao, X., Murray, M., Moriba, G., Agrawala, M., Fatahalia, K., ASSOC COMP MACHINERY
  ASSOC COMPUTING MACHINERY.2021: 3011-3021

- **AGQA: A Benchmark for Compositional Spatio-Temporal Reasoning**
  Grunde-McLaughlin, M., Krishna, R., Agrawala, M., IEEE COMP SOC
  IEEE COMPUTER SOC.2021: 11282-11292

- **Editing Self-Image** *COMMUNICATIONS OF THE ACM*
  Fried, O., Jacobs, J., Finkelstein, A., Agrawala, M.
  2020; 63 (3): 70–79

- **Searching the Visual Style and Structure of D3 Visualizations** *IEEE TRANSACTIONS ON VISUALIZATION AND COMPUTER GRAPHICS*
  Hoque, E., Agrawala, M.
  2020; 26 (1): 1236–45

- **Supporting Visual Artists in Programming through Direct Inspection and Control of Program Execution**

Li, J., Brandt, J., Mech, R., Agrawala, M., Jacobs, J., ACM
ASSOC COMPUTING MACHINERY.2020

- **Answering Questions about Charts and Generating Visual Explanations**
  Kim, D., Hoque, E., Agrawala, M., ACM
  ASSOC COMPUTING MACHINERY.2020
- **Generating Audio-Visual Slideshows from Text Articles Using Word Concreteness**
  Leake, M., Shin, H., Kim, J. O., Agrawala, M., ACM
  ASSOC COMPUTING MACHINERY.2020
- **Text-based Editing of Talking-head Video** *ACM TRANSACTIONS ON GRAPHICS*
  Fried, O., Tewari, A., Zollhofer, M., Finkelstein, A., Shechtman, E., Goldman, D. B., Genova, K., Jin, Z., Theobalt, C., Agrawala, M.
  2019; 38 (4)
- **VisiBlends: A Flexible Workflow for Visual Blends**
  Chilton, L. B., Petridis, S., Agrawala, M., Assoc Comp Machinery
  ASSOC COMPUTING MACHINERY.2019
- **View-Dependent Video Textures for 360 degrees Video**
  Liu, S. J., Agrawala, M., DiVerdi, S., Hertzmann, A., ACM
  ASSOC COMPUTING MACHINERY.2019: 249–62
- **Optimizing Portrait Lighting at Capture-Time Using a 360 Camera as a Light Probe**
  Jane, L. E., Fried, O., Agrawala, M., ACM
  ASSOC COMPUTING MACHINERY.2019: 221–32
- **Editing Spatial Layouts through Tactile Templates for People with Visual Impairments**
  Li, J., Kim, S., Miele, J. A., Agrawala, M., Follmer, S., Assoc Comp Machinery
  ASSOC COMPUTING MACHINERY.2019
- **How to Design Voice Based Navigation for How-To Videos**
  Chang, M., Anh Truong, Wang, O., Agrawala, M., Kim, J., Assoc Comp Machinery
  ASSOC COMPUTING MACHINERY.2019
- **Pinpoint: A PCB Debugging Pipeline Using Interruptible Routing and Instrumentation**
  Strasnick, E., Follmer, S., Agrawala, M., Assoc Comp Machinery
  ASSOC COMPUTING MACHINERY.2019
- **Visual Rhythm and Beat** *ACM TRANSACTIONS ON GRAPHICS*
  Davis, A., Agrawala, M.
  2018; 37 (4)
- **Saliency in VR: How do people explore virtual environments?**
  Sitzmann, V., Serrano, A., Pavel, A., Agrawala, M., Gutierrez, D., Masia, B., Wetzstein, G.
  IEEE COMPUTER SOC.2018: 1633–42
- **Converting Basic D3 Charts into Reusable Style Templates** *IEEE TRANSACTIONS ON VISUALIZATION AND COMPUTER GRAPHICS*
  Harper, J., Agrawala, M.
  2018; 24 (3): 1274–86
- **Mosaic: Designing Online Creative Communities for Sharing Works-in-Progress** *DESIGN THINKING RESEARCH: MAKING DISTINCTIONS: COLLABORATION VERSUS COOPERATION*
  Kim, J., Agrawala, M., Bernstein, M. S.
  edited by Plattner, H., Meinel, C., Leifer, L.
  2018: 105–29
- **Improving Comprehension of Measurements Using Concrete Re-Expression Strategies**
  Hullman, J., Kim, Y., Nguyen, F., Speers, L., Agrawala, M., ACM
  ASSOC COMPUTING MACHINERY.2018

- **RecipeScape: An Interactive Tool for Analyzing Cooking Instructions at Scale**
  Chang, M., Guillain, L. V., Jung, H., Hare, V. M., Kim, J., Agrawala, M., ACM
  ASSOC COMPUTING MACHINERY.2018
- **An Interactive Pipeline for Creating Visual Blends**
  Chilton, L. B., Petridis, S., Agrawala, M., ACM
  ASSOC COMPUTING MACHINERY.2018: 188–90
- **Facilitating Document Reading by Linking Text and Tables**
  Kim, D., Hoque, E., Kim, J., Agrawala, M., Assoc Comp Machinery
  ASSOC COMPUTING MACHINERY.2018: 423–34
- **Computational Video Editing for Dialogue-Driven Scenes** *ACM TRANSACTIONS ON GRAPHICS*
  Leake, M., Davis, A., Truong, A., Agrawala, M.
  2017; 36 (4)
- **Interactive Design and Stability Analysis of Decorative Joinery for Furniture** *ACM TRANSACTIONS ON GRAPHICS*
  Yao, J., Kaufman, D. M., Gingold, Y., Agrawala, M.
  2017; 36 (2)
- **Mosaic: Designing Online Creative Communities for Sharing Works-in-Progress**
  Kim, J., Agrawala, M., Bernstein, M. S., Assoc Comp Machinery
  ASSOC COMPUTING MACHINERY.2017: 246–58
- **Shot Orientation Controls for Interactive Cinematography with 360 degrees Video**
  Pavel, A., Hartmann, B., Agrawala, M., ACM
  ASSOC COMPUTING MACHINERY.2017: 289-297
- **Scanalog: Interactive Design and Debugging of Analog Circuits with Programmable Hardware**
  Strasnick, E., Agrawala, M., Follmer, S., ACM
  ASSOC COMPUTING MACHINERY.2017: 321-330
- **Automatically Visualizing Audio Travel Podcasts**
  Lee, J., Gordon, M., Agrawala, M., Assoc Comp Machinery
  ASSOC COMPUTING MACHINERY.2017: 165-167
- **Generating Personalized Spatial Analogies for Distances and Areas**
  Kim, Y., Hullman, J., Agrawala, M., ACM
  ASSOC COMPUTING MACHINERY.2016: 38-48
- **Data-driven Adaptive History for Image Editing**
  Chen, H., Wei, L., Hartmann, B., Agrawala, M.
  edited by Spencer, S. N.
  ASSOC COMPUTING MACHINERY.2016: 103-111
- **QuickCut: An Interactive Tool for Editing Narrated Video**
  Anh Truong, Berthouzoz, F., Li, W., Agrawala, M., ACM
  ASSOC COMPUTING MACHINERY.2016: 497-507
- **VidCrit: Video-Based Asynchronous Video Review**
  Pavel, A., Goldman, D. B., Hartmann, B., Agrawala, M., ACM
  ASSOC COMPUTING MACHINERY.2016: 517-528
- **Capture-Time Feedback for Recording Scripted Narration**
  Rubin, S., Berthouzoz, F., Mysore, G. J., Agrawala, M., ACM
  ASSOC COMPUTING MACHINERY.2015: 191-199
- **SceneSkim: Searching and Browsing Movies Using Synchronized Captions, Scripts and Plot Summaries**
  Pavel, A., Goldman, D. B., Hartmann, B., Agrawala, M., ACM
  ASSOC COMPUTING MACHINERY.2015: 181-190

- **Interactive Furniture Layout Using Interior Design Guidelines** *ACM TRANSACTIONS ON GRAPHICS*
  Merrell, P., Schkufza, E., Li, Z., Agrawala, M., Koltun, V.
  2011; 30 (4)
- **CommentSpace: Structured Support for Collaborative Visual Analysis**
  Willett, W., Heer, J., Hellerstein, J. M., Agrawala, M., ACM
  ASSOC COMPUTING MACHINERY.2011: 3131-3140
- **Perceptual Guidelines for Creating Rectangular Treemaps** *IEEE TRANSACTIONS ON VISUALIZATION AND COMPUTER GRAPHICS*
  Kong, N., Heer, J., Agrawala, M.
  2010; 16 (6): 990-998
- **Sizing the Horizon: The Effects of Chart Size and Layering on the Graphical Perception of Time Series Visualizations** *27th Annual CHI Conference on Human Factors in Computing Systems*
  Heer, J., Kong, N., Agrawala, M.
  ASSOC COMPUTING MACHINERY.2009: 1303–1312
- **Visualizing dynamic architectural environments** *COMMUNICATIONS OF THE ACM*
  Houston, M., Niederauer, C., Agrawala, M., Humphreys, G.
  2004; 47 (8): 54-59
- **Non-invasive interactive visualization of dynamic architectural environments** *Annual Symposium of the ACM SIGGRAPH*
  Niederauer, C., Houston, M., Agrawala, M., Humphreys, G.
  ASSOC COMPUTING MACHINERY.2003: 700–700
- **Designing effective step-by-step assembly instructions** *Annual Symposium of the ACM SIGGRAPH*
  Agrawala, M., Phan, D., Heiser, J., Hayrnaker, J., Klingner, J., Hanrahan, P., Tversky, B.
  ASSOC COMPUTING MACHINERY.2003: 828–37
- **Cognitive design principles for visualizations: Revealing and instantiating** *25th Annual Conference of the Cognitive-Science-Society*
  Heiser, J., Tversky, B., Agrawala, M., Hanrahan, P.
  LAWRENCE ERLBAUM ASSOC PUBL.2003: 545–550
- **Sketches for design and design of sketches** *Conference on Human Behaviour in Design*
  Tversky, B., Suwa, M., Agrawala, M., Heiser, J., Stolte, C., Hanrahan, P., Phan, D., Klingner, J., Daniel, M. P., Lee, P., Haymaker, J.
  SPRINGER-VERLAG BERLIN.2003: 79–86
- **Conveying shape and features with image-based relighting** *IEEE Visualization 2003 Conference*
  Akers, D., Losasso, F., Klingner, J., Agrawala, M., Rick, J., Hanrahan, P.
  IEEE.2003: 349–354
- **Rendering effective route maps: Improving usability through generalization** *SIGGRAPH 2001*
  Agrawala, M., Stolte, C.
  ASSOC COMPUTING MACHINERY.2001: 241–250
- **Efficient image-based methods for rendering soft shadows** *Computer Graphics Annual Conference*
  Agrawala, M., Ramamoorthi, R., Heirich, A., Moll, L.
  ASSOC COMPUTING MACHINERY.2000: 375–384
- **Artistic multiprojection rendering** *11th Eurographics Workshop on Rendering*
  Agrawala, M., Zorin, D., Munzner, T.
  SPRINGER-VERLAG WIEN.2000: 125-?
- **Model-based compression for synthetic animations** *International Conference on Image Processing (ICIP-96)*
  Chaddha, N., Agrawala, M., Beers, A.
  IEEE.1996: 417–420