

KOKI NAGANO

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RESEARCH INTERESTS

Realistic Digital Avatars, Human Digitization, Neural Rendering, Generative Models,
Appearance Capture, Facial Animation, Performance Capture, Virtual Telepresence, AR/VR,
Media Forensics, Deep Learning, AI

EDUCATION

University of Southern California (USC), Los Angeles, CA 8/2012 – 8/2017
Viterbi School of Engineering, Ph.D. student, Department of Computer Science

Tokyo Institute of Technology, Tokyo 4/2008 - 3/2012
B.E., Environmental Design Program, Department of Social Engineering, School of Engineering

The Film School of Tokyo Summer Program, Tokyo 8/2009
Practical movie shooting training with a 16 mm film camera along with professional filming
equipment. Learned the manipulation of lighting equipment, direction and linear film editing.

WORK EXPERIENCE

NVIDIA Research 8/2020– present
Principal Research Scientist

Pinscreen, Inc. 5/2017– 8/2020
Principal Scientist

Graphics Lab, USC Institute for Creative Technologies 5/2017– 1/2019
Researcher

Graphics Lab, USC Institute for Creative Technologies 6/2012 – 5/2017
Graduate Research Assistant
Advisor: Dr. Paul Debevec

Oculus Research / Facebook Pittsburgh 8/2016 – 1/2017
Research Intern
Director: Dr. Yaser Sheikh

Weta Digital

5/2016 – 7/2016

Research Intern

Manager: Dr. Antoine Bouthors

Institut de recherche en informatique et systèmes aléatoires (IRISA), Rennes 4, 5/2012

Visiting Research Assistant

Advisors: Dr. Sumanta Pattanaik, Dr. Kadi Bouatouch

Scritter Project, Tokyo Institute of Technology

10/2009 - 3/2012

Undergraduate Student Researcher

Advisors: Dr. Akihiko Shirai, Dr. Masayuki Nakajima

PEER-REVIEWED PUBLICATIONS AND PREPRINTS

39. What You See Is What You GAN: Rendering Every Pixel for High-Fidelity Geometry in 3D GANs

Alex Trevithick, Matthew Chan, Towaki Takikawa, Umar Iqbal, Shalini De Mello, Manmohan Chandraker, Ravi Ramamoorthi, [Koki Nagano](#), In *Proceedings of the IEEE International Conference on Computer Vision and Pattern Recognition*. (CVPR 2024)

38. Dream-in-4D: A Unified Approach for Text- and Image-guided 4D Scene Generation

Yufeng Zheng, Xueting, [Koki Nagano](#), Sifei Liu, Karsten Kreis, Otmar Hilliges, Shalini De Mello, In *Proceedings of the IEEE International Conference on Computer Vision and Pattern Recognition*. (CVPR 2024)

37. GAvatar: Animatable 3D Gaussian Avatars with Implicit Mesh Learning

Ye Yuan*, Xueting Li*, Yangyi Huang, Shalini De Mello, [Koki Nagano](#), Jan Kautz, Umar Iqbal, In *Proceedings of the IEEE International Conference on Computer Vision and Pattern Recognition*. (CVPR 2024)

36. Generalizable One-shot Neural Head Avatar

Xueting Li, Shalini De Mello, Sifei Liu, [Koki Nagano](#), Umar Iqbal, Jan Kautz, In *Proceedings of the Advances in Neural Information Processing Systems 2024* (NeurIPS 2023)

35. GeNVS: Generative Novel View Synthesis with 3D-Aware Diffusion Models

E. Chan*, [K. Nagano](#)*, M. Chan*, A. Bergman*, JJ Park*, A. Levy, M. Aittala, S. De Mello, T. Karras, G. Wetzstein, In *Proceedings of the IEEE International Conference on Computer 2023*. (ICCV 2023 Oral Presentation)

34. RANA: Relightable Articulated Neural Avatars

Umar Iqbal, Akin Caliskan, [Koki Nagano](#), Sameh Khamis, Pavlo Molchanov, Jan Kautz, In *Proceedings of the IEEE International Conference on Computer 2023*. (ICCV 2023)

33. Avatar Fingerprinting for Authorized Use of Synthetic Talking-Head Videos

Ekta Prashnani, [Koki Nagano](#), Shalini De Mello, David Luebke, Orazio Gallo, In *Arxiv 2023*

32. Live 3D Portrait: Real-Time Radiance Fields for Single-Image Portrait View Synthesis

Alex Trevithick, Matthew Chan, Michael Stengel, Eric R. Chan, Chao Liu, Zhiding Yu, Sameh Khamis, Manmohan Chandraker, Ravi Ramamoorthi, [Koki Nagano](#), In *ACM Transactions on Graphics, Proceedings of the ACM SIGGRAPH Conference and Exhibition 2023*. (SIGGRAPH 2023)

31. SSIF: Single-shot Implicit Morphable Faces with Consistent Texture Parameterization

- Connor Lin, [Koki Nagano](#), Jan Kautz, Eric R. Chan, Umar Iqbal, Leonidas Guibas, Gordon Wetzstein, Sameh Khamis, In *Proceedings of the ACM SIGGRAPH Conference and Exhibition 2023*. (SIGGRAPH 2023)
- 30. Intriguing Properties of Synthetic Images: from Generative Adversarial Networks to Diffusion Models**
Riccardo Corvi, Davide Cozzolino, Giovanni Poggi, [Koki Nagano](#), Luisa Verdoliva, In *CVPR Workshop on Media Forensics 2023*
- 29. On the Detection of Synthetic Images Generated by Diffusion Models**
Riccardo Corvi, Davide Cozzolino, Giada Zingarini, Giovanni Poggi, [Koki Nagano](#), Luisa Verdoliva, In *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing 2023*. (ICASSP 2023, Top 3% Paper)
- 28. Lumos: Learning to Relight Portrait Images via a Virtual Light Stage and Synthetic-to-Real Adaptation**
Yu-Ying Yeh, [Koki Nagano](#), Sameh Khamis, Jan Kautz, Ming-Yu Liu, Ting-Chun Wang, In *ACM Transactions on Graphics, Proceedings of the ACM SIGGRAPH Conference and Exhibition in Asia 2022*. (SIGGRAPH ASIA 2022)
- 27. Fusing Global and Local Features for Generalized AI-Synthesized Image Detection**
Yan Ju, Shan Jia, Lipeng Ke, Hongfei Xue, [Koki Nagano](#), Siwei Lyu, In *Proceedings of the IEEE International Conference on Image Processing 2022*. (ICIP 2022)
- 26. Efficient Geometry-aware 3D Generative Adversarial Networks**
Eric Ryan Chan*, Connor Zhizhen Lin*, Matthew Aaron Chan*, [Koki Nagano*](#), Boxiao Pan, Shalini De Mello, Orazio Gallo, Leonidas Guibas, Jonathan Tremblay, Sameh Khamis, Tero Karras, Gordon Wetzstein, In *Proceedings of the IEEE International Conference on Computer Vision and Pattern Recognition*. (CVPR 2022 Oral Presentation)
- 25. Frame Averaging for Equivariant Shape Space**
Matan Atzmon, [Koki Nagano](#), Sanja Fidler, Sameh Khamis, Yaron Lipman, In *Proceedings of the IEEE International Conference on Computer Vision and Pattern Recognition 2022*. (CVPR 2022)
- 24. RTMV: A Ray-Traced Multi-View Synthetic Dataset for Novel View Synthesis**
Jonathan Tremblay*, Moustafa Meshry*, Alex Evans, Jan Kautz, Alexander Keller, Sameh Khamis, Charles Loop, Nathan Morrical, Thomas Müller, [Koki Nagano](#), Towaki Takikawa, Stan Birchfield, In *ECCV Workshop on Learning to Generate 3D Shapes and Scenes 2022*
- 23. Normalized Avatar Synthesis Using StyleGAN and Perceptual Refinement**
Huiwen Luo, [Koki Nagano](#), Han-Wei Kung, Mclean Goldwhite, Qingguo Xu, Zejian Wang, Lingyu Wei, Liwen Hu, Hao Li, In *Proceedings of the IEEE International Conference on Computer Vision and Pattern Recognition 2021*. (CVPR 2021)
- 22. Deep Face Normalization**
[Koki Nagano](#), Huiwen Luo, Zejian Wang, Jaewoo Seo, Jun Xing, Liwen Hu, Lingyu Wei, Hao Li, In *ACM Transactions on Graphics, Proceedings of the ACM SIGGRAPH Conference and Exhibition in Asia 2019*. (SIGGRAPH ASIA 2019)
- 21. Hairbrush for Immersive Data-Driven Hair Modeling**
Jun Xing, [Koki Nagano](#), Weikai Chen, Haotian Xu, Li-Yi Wei, Yajie Zhao, Jingwan Lu, Byungmoon Kim, Hao Li, In *Proceedings of the ACM User Interface Software and Technology Symposium 2019*. (UIST 2019)
- 20. Protecting World Leaders Against Deep Fakes**
Shruti Agarwal, Hany Farid, Yuming Gu, Mingming He, [Koki Nagano](#), Hao Li, In *Workshop on Media Forensics, CVPR 2019*

19. **paGAN: Real-Time Avatars using Dynamic Textures**
Koki Nagano, Jaewoo Seo, Jun Xing, Lingyu Wei, Zimo Li, Shunsuke Saito, Aviral Agarwal, Jens Fursund, Hao Li, In *ACM Transactions on Graphics, Proceedings of the ACM SIGGRAPH Conference and Exhibition in Asia 2018*. (SIGGRAPH ASIA 2018)
18. **High-Fidelity Facial Reflectance and Geometry Inference from an Unconstrained Image**
 Shugo Yamaguchi, Shunsuke Saito, Koki Nagano, Yajie Zhao, Weikai Chen, Kyle Olszewski, Shigeo Morishima, Hao Li, In *ACM Transactions on Graphics, Proceedings of the ACM SIGGRAPH Conference and Exhibition 2018*. (SIGGRAPH 2018)
17. **Mesoscopic Facial Geometry Inference using Deep Neural Networks**
 Loc Huynh, Weikai Chen, Shunsuke Saito, Jun Xing, Koki Nagano, Andrew Jones, Paul Debevec, Hao Li, In *Proceedings of the IEEE International Conference on Computer Vision and Pattern Recognition 2018*. (CVPR 2018 Spotlight Presentation)
16. **Avatar Digitization from A Single Image for Real-time Rendering**
 Liwen Hu, Shunsuke Saito, Lingyu Wei, Koki Nagano, Jaewoo Seo, Jens Fursund, Iman Sadeghi, Carrie Sun, YenChun Chen, Hao Li, In *ACM Transactions on Graphics, Proceedings of the ACM SIGGRAPH Conference and Exhibition in Asia 2017*. (SIGGRAPH ASIA 2017)
15. **Multi-view Stereo on Consistent Face Topology**
 Graham Fyffe*, Koki Nagano*, Loc Huynh, Shunsuke Saito, Jay Bush, Andrew Jones, Hao Li, Paul Debevec (*joint first authors), In *Computer Graphics Forum Vol. 36, Issue 2*, (Eurographics 2017 Full Papers)
14. **Photorealistic Facial Texture Inference Using Deep Neural Networks**
 Shunsuke Saito, Lingyu Wei, Liwen Hu, Koki Nagano, Hao Li, In *Proceedings of the IEEE International Conference on Computer Vision and Pattern Recognition 2017*. (CVPR 2017 Spotlight Presentation)
13. **Time-Offset Conversations on a Life-Sized Automultiscopic Projector Array**
 Andrew Jones, Koki Nagano, Jay Busch, Xueming Yu, Hsuan-Yueh Peng, Joseph Barreto, Oleg Alexander, Mark Bolas, Paul Debevec, and Jonas Unger, In *CVPR Workshop on Computational Cameras and Displays 2016*
12. **Massively Parallel Inverse Rendering Using Multi-Objective Particle Swarm Optimization**
Koki Nagano, Thomas Collins, Chi-An Chen, Aiichiro Nakano, In *Journal of Visualization 2016*
11. **GPU-Based Inverse Rendering with Multi-Objective Particle Swarm Optimization**
Koki Nagano, Thomas Collins, Chi-An Chen, Aiichiro Nakano, In *ACM SIGGRAPH ASIA 2015 Symposium on Visualization in High Performance Computing*. (SIGGRAPH ASIA 2015)
10. **Skin Microstructure Deformation with Displacement Map Convolution**
Koki Nagano, Graham Fyffe, Oleg Alexander, Jernej Barbič, Hao Li, Abhijeet Ghosh, Paul Debevec, In *ACM Transactions on Graphics, Proceedings of the ACM SIGGRAPH Conference and Exhibition 2015*. (SIGGRAPH 2015)
9. **Building a Life-Size Automultiscopic Display Using Consumer Hardware**
 Andrew Jones, Jonas Unger, Koki Nagano, Jay Busch, Xueming Yu, Hsuan-Yueh Peng, Oleg Alexander, Paul Debevec, In *GPU Technology Conference 2015 Presentation*
8. **Measurement and modeling of microfacet distributions under deformation**
Koki Nagano, Oleg Alexander, Jernej Barbič, Hao Li, Paul Debevec, In *ACM SIGGRAPH 2014 Conference and Exhibition Talks* (SIGGRAPH 2014)
7. **Creating a life-sized automultiscopic Morgan Spurlock for CNNs "Inside Man"**
 Andrew Jones, Jonas Unger, Koki Nagano, Jay Busch, Xueming Yu, Hsuan-Yueh Peng, Oleg

- Alexander, Paul Debevec, In *ACM SIGGRAPH 2014 Conference and Exhibition Talks*. (SIGGRAPH 2014)
6. **Interpolating vertical parallax for an autostereoscopic 3D projector array**
Andrew Jones, [Koki Nagano](#), Jing Liu, Jay Busch, Xueming Yu, Mark Bolas, Paul Debevec, *SPIE Stereoscopic Displays and Applications XXV* 2014.
 5. **Interpolating vertical parallax for an autostereoscopic 3D projector array**
Andrew Jones, [Koki Nagano](#), Jing Liu, Jay Busch, Xueming Yu, Mark Bolas, Paul Debevec, the *Journal of Electronic Imaging* Vol. 23(1) 2014.
 4. **Driving high-resolution facial blendshapes with video performance capture**
Graham Fyfe, Andrew Jones, Oleg Alexander, Ryosuke Ichikari, Paul Graham, [Koki Nagano](#), Jay Busch, Paul Debevec, In *ACM SIGGRAPH 2013 Conference and Exhibition Talks*. (SIGGRAPH 2013)
 3. **ScritterHDR: Multiplex-Hidden Imaging on High Dynamic Range Projection**
[Koki Nagano](#), Takeru Utsugi, Kazuhisa Yanaka, Akihiko Shirai, Masayuki Nakajima, In *ACM SIGGRAPH ASIA 2011 Conference and Exhibition Technical Sketches & Posters*. (SIGGRAPH ASIA 2011)
 2. **A new ‘multiplex content’ displaying system compatible with current 3D projection technology**
[Koki Nagano](#), Takeru Utsugi, Mika Hirano, Takeo Hamada, Akihiko Shirai, Masayuki Nakajima, In *ACM SIGGRAPH 2010 Conference and Exhibition Posters*. (SIGGRAPH 2010)
 1. **Scritter: A multiplexed image system for a public screen**
Takeo Hamada, [Koki Nagano](#), Takeru Utsugi, Akihiko Shirai, *Proceedings of Virtual Reality International Conference Laval Virtual*, 2010, pp. 321–323.

TECHNICAL REPORTS, ARTICLES AND PATENT

- **StyleGAN3 Synthetic Image Detection**
Github project, Oct 2021
- **One-Shot Identity-Preserving Portrait Reenactment**
Sitao Xiang, Yuming Gu, Pengda Xiang, Mingming He, [Koki Nagano](#), Haiwei Chen, Hao Li, In *arXiv: 2004.12452*. (arXiv 2020)
- **Real-Time Avatars Using Dynamic Textures**
Hao Li, [Koki Nagano](#), Jaewoo Seo, Lingyu Wei, Jens Fursund, US Provisional Patent (US20180374242A1), filed 08/2018
- **Avatar Digitization from a Single Image for Real-Time Rendering**
Hao Li, Liwen Hu, Lingyu Wei, [Koki Nagano](#), Jaewoo Seo, Jens Fursund, US Patent (US20180374242A1), filed 08/2018
- **SIGGRAPH 2015 Technical Papers report (in Japanese)**
Virtual Reality Society of Japan Journal Vol. 20 (3), 2015
- **Understanding Skin Roughness**
Web article at Wikihuman.org, 2015
- **Information Display**
Akihiko Shirai, [Koki Nagano](#), Takeru Utsugi, Takeo Hamada, Mika Hirano, Japan Patent Application (2010-088213), filed 6th April 2010.

FEATURE FILMS

- “Free Guy” for Facial Reflectance Capture, 2021
- “Terminator: Dark Fate” for Facial Reflectance Capture (uncredited), 2019
- “Aladdin” for Facial Reflectance Capture (uncredited), 2019
- “Follow This” by Netflix/BuzzFeed, 2018
- “Ready Player One” for Facial Reflectance Capture (uncredited), 2018
- “Blade Runner 2049” for Facial Reflectance Capture Light Stage Technicians, 2017
- “Thor Ragnarok” for Facial Reflectance Capture, 2017
- “War for the Planet of the Apes”, R&D internship at Weta Digital (uncredited), 2017
- “Valerian and the City of a Thousand Planets” for Facial Reflectance Capture Light Stage Engineer, 2017
- “Logan” for Facial Reflectance Capture Light Stage Technicians (uncredited), 2017
- “Underworld: Blood Wars” for Facial Reflectance Capture (uncredited), 2016
- “The BFG” for Facial Reflectance Capture (uncredited), 2015
- “Central Intelligence” for Facial Reflectance Capture (uncredited), 2015

TECH TALKS, COURSE NOTES, DEMOS AND INSTALLATIONS

24. **AI-Mediated 3D Video Conferencing**
Michael Stengel, [Koki Nagano](#), Chao Liu, Matthew Chan, Alex Trevithick, Shalini De Mello, Jonghyun Kim, David Luebke, In *ACM SIGGRAPH 2023 Conference and Exhibition Emerging Technologies*. (SIGGRAPH 2023)
23. **State of the Art in Telepresence**
Jason Lawrence, Ye Pan, Dan B Goldman, Rachel McDonnell, Carol O’Sullivan, Dave Luebke, [Koki Nagano](#), Michael Zollhoefer, Jason Saragih, In *ACM SIGGRAPH 2023 Conference and Exhibition Courses*. (SIGGRAPH 2023)
22. **Expert Breakout: Discovering NVIDIA's Digital Human Research and Technologies**
Ming-Yu Liu, Simon Yuen, Evgeny Tumanov, [Koki Nagano](#), Rafael Valle, Yeongho Seol, Arun Mallya, In GTC 2021
21. **I am AI: AI-driven Digital Avatar Made Easy**
Ming-yu Liu, [Koki Nagano](#), Yeongho Seol, Rafael Valle, Jaewoo Seo, Ting-Chun Wang, Arun Mallya, Sameh Khamis, Wei Ping, Rohan Badlani, Kevin J. Shih, Bryan Catanzaro, Simon Yuen and Jan Kautz, In *ACM SIGGRAPH Conference and Exhibition Real Time Live!* (SIGGRAPH 2021)
20. **I am AI: AI-driven Digital Avatar Made Easy**
Ming-yu Liu, [Koki Nagano](#), Yeongho Seol, Rafael Valle, Jaewoo Seo, Ting-Chun Wang, Arun Mallya, Sameh Khamis, Wei Ping, Rohan Badlani, Kevin J. Shih, Bryan Catanzaro, Simon Yuen and Jan Kautz, In *ACM SIGGRAPH Conference and Exhibition Real Time Live!* (SIGGRAPH 2021)
19. **Normalized Avatar Digitization For Communication in VR**
McLean Goldwhite, Zejian Wang, Huiwen Luo, Han-Wei Kung, [Koki Nagano](#), Liwen Hu, Lingyu Wei, Hao Li, In *ACM SIGGRAPH Conference and Exhibition Real Time Live!* (SIGGRAPH 2021)
18. **State of the art for Realistic Digital Human Synthesis**
[Koki Nagano](#), In *Computational Disinformation Symposium 2021*
17. **Real-Time Audio and Text Driven Talking Head Synthesis**
[Koki Nagano](#), In *Lightning Talk at the DARPA SemaFor PI Meeting 2021*
16. **Face Value: What Computers Can Do with Human Likeness, And What it Means for Our Future**

- Kyle McDonald, [Koki Nagano](#), Omer Shapira, In *GTC 2021*
15. **AI-Synthesized Avatars: From Real-Time Deepfakes To Photoreal AI Virtual Assistant**
Zejian Wang, [Koki Nagano](#), Hao Li, Liwen Hu, Lain Goldwhite, Hanwei Kung, Aviral Agarwal, Lingyu Wei, Yenchun Chen, Qingguo Xu, Jaewoo Seo, Huiwen Luo, In *ACM SIGGRAPH Conference and Exhibition Real Time Live!* (SIGGRAPH 2020)
 14. **Deepfake Live**
Hao Li, [Koki Nagano](#), Zejian Wang, Yen-Chun Chen, Warner Bros. CES on the Lot 2020
 13. **DeepFaked**
Hao Li, Jaewoo Seo, [Koki Nagano](#), McLean Goldwhite, Huiwen Luo, Zejian Wang, Lingyu Wei, Yen-Chun Chen, In *World Economic Forum: Annual Meeting* (WEF AM 2020)
 12. **Truth in Graphics and the Future of AI-Generated Content**
Hao Li, Juan Miguel de Joya, Tianxiang Zheng, Sergey Demyanov, Noelle Martin, Alain Chesnais, [Koki Nagano](#), Bill Posters, Per Karlsson, Taylor Beck, Alexandre de Brébisson, Jassim Happa, In *ACM SIGGRAPH Asia 2019 Frontiers Workshop*
 11. **VR Hair Salon for Avatars**
Jun Xing, Liwen Hu, [Koki Nagano](#), Li-Yi Wei, Hao Li, In *ACM SIGGRAPH Conference and Exhibition Real Time Live!* (SIGGRAPH 2019)
 10. **The Human Element” Digital Mimicry**
Hao Li, Jaewoo Seo, [Koki Nagano](#), Zejian Wang, Liwen Hu, Lingyu Wei, Yen-Chun Chen, In *World Economic Forum: Annual Meeting of the New Champions* (WEF AMNC 2019)
 9. **Pinscreen avatars in your pocket: mobile paGAN engine and personalized gaming**
[Koki Nagano](#), Shunsuke Saito, Mclean Goldwhite, Kyle San, Aaron Hong, Liwen Hu, Lingyu Wei, Jun Xing, Qingguo Xu, Hanwei Kung, Jiale Kuang, Aviral Agarwal, Erik Castellanos, Jaewoo Seo, Jens Fursund, Hao Li, In *ACM SIGGRAPH Conference and Exhibition Real Time Live!* (SIGGRAPH ASIA 2018)
 8. **Deep Learning-Based Photoreal Avatars for Online Virtual Worlds in iOS**
[Koki Nagano](#), Jaewoo Seo, Jun Xing, Kyle San, Aaron Hong, Mclean Goldwhite, Jiale Kuang, Aviral Agarwal, Caleb Arthur, Hanwei Kung, Stuti Rastogi, Carrie Sun, Stephen Chen, Jens Fursund, Hao Li, In *ACM SIGGRAPH Conference and Exhibition Real Time Live!* (SIGGRAPH 2018)
 7. **Pinscreen: creating performance-driven avatars in seconds**
Hao Li, Liwen Hu, [Koki Nagano](#), Jaewoo Seo, Shunsuke Saito, Lingyu Wei, Iman Sadeghi, Jens Fursund, Yen-Chun Chen, Stephen Chen, Carrie Sun, In *ACM SIGGRAPH Conference and Exhibition in 2017 Real Time Live!* (SIGGRAPH 2017)
 6. **Skin Stretch: Simulating Dynamic Skin Microgeometry**
[Koki Nagano](#), Graham Fyffe, Jason Huang, Oleg Alexander, Jay Busch, Christopher Nichols, Vladimir Koylazov, Rusko Ruskov, Mathieu Aerni, Danny Young, and Paul Debevec. In *ACM SIGGRAPH Conference and Exhibition 2015 Computer Animation Festival*. (SIGGRAPH 2015)
 22. **An Automultiscopic Projector Array for Interactive Digital Humans**
Andrew Jones, Jonas Unger, [Koki Nagano](#), Jay Busch, Xueming Yu, Hsuan-Yueh Peng, Oleg Alexander, Paul Debevec. In *ACM SIGGRAPH 2015 Conference and Exhibition Emerging Technologies*. (SIGGRAPH 2015)
 4. **An autostereoscopic projector array optimized for 3D facial display**
[Koki Nagano](#), Andrew Jones, Jing Liu, Jay Busch, Xueming Yu, Mark Bolas, Paul Debevec. In *ACM SIGGRAPH 2013 Conference and Exhibition Emerging Technologies*. (SIGGRAPH 2013)
 3. **Digital Ira: High-Resolution Facial Performance Playback**

USC Institute for Creative Technologies, Joe Alter, Inc., Activision, Inc., In *ACM SIGGRAPH Conference and Exhibition Real Time Live!* (SIGGRAPH 2013)

2. **“Lifelike Human Face Rendering”**, NVIDIA Demo, May 2013 [[demo](#)]
1. **“Activision R&D Real-time Character Demo”**, Demo Movie, March 2013 [[demo](#)]

TEACHING

Guest Lectures

- **Frontiers of Neural Human Synthesis**
Guest lecture talk at US Government
- **Capturing Photorealistic Digital Humans**
CSCI 621 Digital Geometry Processing, USC
- **Capturing Photorealistic Digital Humans**
CSCI 576 Multimedia Systems Design, USC

Teaching Assistant

10/2011 - 11/2011

Tokyo Tech CSWC 0856: Media Art Technological Method

AWARDS AND HONORS

- **Outstanding Reviewers**, CVPR 2023
- **Best-in-Show Award at SIGGRAPH Real-Time Live! 2021**
- **Finalist of Innovators Under 35 (TR35) by MIT Technology Review**
- **Google PhD Fellowship 2016** (Mentor: Dr. Avneesh Sud); one of 15 awardees selected from US/Canada PhD students
- **Dean’s Fellowship from the USC Viterbi School of Engineering** for Spring 2016, Jan 2016
- **DC EXPO 2015 Special Prize** by Japanese Ministry of Economy, Trade and Industry’s (METI) Digital Content Expo 2015 (chosen from SIGGRAPH 2015 E-Tech exhibits) for “An Auto-multiscopic Projector Array for Interactive Digital Humans”, Oct 2015
- **Best Final Project Prize in CSCI 596 “Scientific Computing and Visualization”**
for the final project “GPU-Accelerated Inverse Rendering Using Multi-Objective Particle Swarm Optimization”, Dec 2014
- **Best “Audience Choice” prize (First prize) in CSCI 599 “Digital Geometry Processing”**
for the final project “As-Rigid-As Possible Surface Modeling for Heterogeneous Deformable Surfaces”, May 2014
- **Funai Overseas Scholarship** includes my full tuition, full medical insurance and living costs \$2,500/month for two years from 2012 and round-trip expense and preparation expense about \$6,500 (¥500,000).
- **First Academic Prize** in the JASSO’s Student of the Year 2011 with a prize of about \$6,500 (¥500,000) from the Japan Student Services Organization, December 2011
- **Best Media Art Award** from the Center for the Study of World Civilizations, March 2011
- **VRSJ Young Researchers Award** from the Virtual Reality Society of Japan, March 2011
- **Tokyo Tech Award for Student Leadership 2010** from the President of Tokyo Tech, October 2010

- **Tokyo Tech 130th Anniversary Memorial Fund** for academic presentations, July-September 2010
- **Excellent Contents Award** from the Society for Art and Science, March 2010

SELECTED PRESS & MEDIA COVERAGE

- Deepfakes: A threat to democracy or just a bit of fun?, BBC, Jan 2020
- GO THERE in Davos, CNN, Jan 2020
- Fake Busters, NHK Closeup Gendai, Dec 2019
- The world's top deepfake artist is wrestling with the monster he created, MIT Technology Review, Aug 2019
- Deepfake debunking tool may protect presidential candidates. For now. Sometimes, CNET, June 2019
- Deepfake detection algorithms will never be enough, The Verge+, June 2019
- A new deepfake detection tool should keep world leaders safe—for now, MIT Technology Review, June 2019
- Enquête | Deepfake : le vrai du faux, Radio-Canada, Jan 2019
- The Fifth Estate TV Episode on “The Deepfake”, CBC Nov 2018
- A Netflix original show “Follow This” from BuzzFeed and Netflix, Aug 2018
- A.I. at SIGGRAPH: Part 2. Pinscreen at Real Time Live, fxguide, Aug 2018
- All it takes is a selfie to manipulate someone's face, and literally put words in their mouth, CBS Evening News, Apr 2018
- Get Your Geek On: Image Manipulation Technology, Channel One News, Mar 2018
- What used to take a **sophisticated Hollywood production** company week could soon be accomplished in seconds by anyone with a smartphone, LA Times, Feb 2018 (Featured in front page)
- Manipulation von Videos: Was ist noch echt? ARD, Feb 2018
- All the Face-Tracking Tech Behind Apple's Animoji, Wired, Oct 2017
- Exhibit allows virtual ‘interviews’ with Holocaust survivors, Washingtonpost, Sep 2017
- The 7 **best highlights from Siggraph** 2017, Digital Arts, Aug 2017
- The CG Actors in ‘Logan’ You Never Knew Were There, Cartoon Brew, Mar 2017
- Face me part1: photorealistic facial texture from a single still, fxguide Dec 2016
- Neural Networks Can Now Turn a Single Photo into a Creepy 3D Face Render, GIZMODO Dec 2016
- Featuring articles in the “Lighthouse” magazine Los Angeles in April 2016, and Portland/Seattle in November 2016
- How USC's Automultiscopic 3D Display Works, Tested, Sep 2016
- Hot Stuff! Guncy's Eye (special feature on my recent paper and work at USC), CGWORLD Magazine (Japan), December 2015
- ACM Digital Library Selection with “Skin Microstructure Deformation with Displacement Map Convolution”, ACM, Sep 2015
- Creating **Perfect Skin**, Imperial College London ([image](#)), Aug 2015
- **A Graphics Breakthrough** Makes Perfect CGI Skin, GIZMODO, Aug 2015
- Finally, A **Convincing 3D Display** That Doesn't Require Glasses, GIZMODO, Aug 2015
- An Automultiscopic Projector Array for Interactive Digital Humans, Creative Applications, Aug 2015
- Digital Faces Are Looking More Human Than Ever, The Verge, Aug 2015

- Will This New Development in CGI Skin Overcome the Uncanny Valley?, Mental floss, Aug 2015
- CGI Skin Just Got a Whole Lot More Realistic, MOTHERBOARD, Aug 2015
- This **Graphical Breakthrough** Will Allow Lifelike Skin Texture in Future Games, UNILAD, Aug 2015
- Convincing computer-generated people take one step closer, BT, Aug 2015
- SIGGRAPH technical papers highlight, fxguide, Aug 2015
- Videos: **the best of Siggraph 2015's** technical papers, CG Channel.com, Jun 2015
- USC dazzles with new technology that enhances CG skin dramatically, CNET Tomorrow Daily, Jun 2015
- Advances in Skin Rendering Technology Are A Little Gross but Mostly Fascinating, digg, Jun 2015
- It Feels Like These CGI Skin Designers Are Just Trying to Scare Us Now, GIZMODO, Jun 2015
- This Is **the Most Realistic CGI Skin** We've Ever Seen, Fast Company, Jun 2015
- Researchers create creepy, **hyper realistic** CGI skin, Slash Gear, Jun 2015
- Skin Rendering Technology: How to Make Animated Skin Look **Incredibly Real**, Medical Daily, Jun 2015
- Skin Stretch, Prosthetic Knowledge, Jun 2015
- Holograms add new dimension to Holocaust survivor's story, NBC Today, May 2015
- How to live forever, Morgan Spurlock's CNN Inside Man Episode 2, Apr 2014
- 3-D Projector **Blurs Lines Between Fantasy, Reality**, Wall Street Journal, 2013
- Highlights of SIGGRAPH 2013 Emerging Technologies, SIGGRAPHITTI, May 2013

INVITED TALKS AND SEMINARS

- **In the Era of Synthetic Avatars: From Training to Verification**
Keynote at WACV 2024 FRCSyn: Face Recognition Challenge in the Era of Synthetic Data, virtual, January 2024
- **AI-Mediated Telepresence**
Invited Talk at The 27th SANKEN International Symposium, Japan, January 2024
- **AI-Mediated 3D Video Conferencing with Real-Time 2D-to-3D Face Lifting**
Invited Talk at Imaging for XR Workshop 2024, Virtual, January 2024
- **Frontiers of Neural Human Synthesis**
Tutorial Keynote at MIRU 2023, Japan, July 2023, Keynote at CVPR 2023 Media Forensics Workshop, Jun 2023, High-Beams Seminars at UCL, Oct 2022
- **AI-Driven Photorealistic Human Synthesis**
Huawei Digital Human Workshop (Dec 2021), Technical Seminar at STR (Jul 2021), the Silicon Valley ACM SIGGRAPH (Jan 2021), CRDH : FROM CAPTURE TO RENDERING OF DIGITAL HUMANS FOR AR/VR workshop at IEEE AIVR 2020 (Dec 2020), Overseas advanced VR tech workshop in Korea (Dec 2020)
- **[Face-ing Our Realistic Digital Self](#)**
TEDxCharlottesville, Charlottesville, VA, Nov 2019
- **Fighting Deepfakes with Deepfakes**
ACM SIGGRAPH Frontiers Workshop on Truth in Graphics and Future of AI-Generated Content, Nov 2019
- **Capturing, Displaying and Learning Photorealistic Digital Humans**
Hachisuka Lab, Dept. of Creative Informatics, University of Tokyo, Dec 2018
- **Will AI change the future? Case study in digital humans**

- Japanese Educational Resource Center, Jan 2018
- **State-of-the-art in Digital Performance Capture**
45th forum by the Southern California Japanese Scholars Forum & Japan America Business Association, Mar 2017
 - **Capturing High Resolution Photorealistic Faces and Performance**
Waseda University, Toei Company, LTD., Feb 2017
 - **Capturing High Resolution Photorealistic Faces**
Waseda University, Oct 2015
Digital Frontier Inc, Oct 2015
Toppan Printing Inc, Oct 2015
 - **Skin Microstructure Deformation Using Displacement Map Convolution**
Weta Digital, Jul 2016
Department of Computing, Imperial College London, Jul 2015
Digital Domain Chalk Talk, Sep 2015
Visual Computing/GCAD Symposium 2015, Jun 2015
 - **Career Forum**
Lighthouse Career Forum, Aug 2015
 - **Study Abroad Career Forum**
Tokyo Institute for Technology, Japanese Graduate Student Association in the United States, Jun 2014
Osaka University, Japanese Graduate Student Association in the United States, Dec 2012
Kyoto University, Japanese Graduate Student Association in the United States, Dec 2012

SOFTWARE, LIBRARIES AND DATASET

- **Pinscreen: Instant 3D Avatars**
<http://pinscreen.com/>
- **Vega FEM Library**
<http://run.usc.edu/vega/> (contributed to the ARAP surface deformation code)
- **The Wikihuman Project (Digital Emily 2.0)**
<http://vgl.ict.usc.edu/Data/DigitalEmily2/>
- **Skin Microstructure Deformation Shaders**
<http://vgl.ict.usc.edu/Software/SkinStretchShaderGLSL/>

PROFESSIONAL SERVICE

- Reviewer:
SIGGRAPH
SIGGRAPH ASIA
ACM Transactions on Graphics
CVPR
3DV
CVMP
IEEE VR
IEEE Transactions on Visualization and Computer Graphics
Eurographics

- Computer Graphics Forum
- Pacific Graphics
- GCAD
- Program Committee
- IEEE AIXVR 2024
- ACM SIGGRAPH ASIA 2017/2018 Technical Briefs & Posters

TECHNICAL SKILLS

- Programming: PyTorch/TensorFlow/C/C++/C#/OpenGL/GLSL/OpenCV/Java/Vega FEM/CUDA/Python/Matlab/Mathematica/MPI/OpenMP/LaTeX/JavaScript/HTML/
- Professional Tools: Unity3D, Nuke, Maya, V-Ray, Unreal Engine 4, Mudbox; Premiere Pro, Photoshop, After Effects;
- CG Engineering/Creation: Expert grade at Computer Graphic Certificate, CG-ARTS Society
- Calligraphy; drawing and painting (Japanese ink)
- Languages: Japanese (native), English (fluent), French (conversational)