

Vincent Sitzmann

Curriculum Vitae

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Education and Experience

- since 07/22 **Assistant Professor**, *Massachusetts Institute of Technology*, Cambridge, MA.
Leading the [Scene Representation Group](#) at the MIT Computer Science and Artificial Intelligence Laboratory (CSAIL).
- 07/20–07/22 **Postdoctoral Associate**, *Massachusetts Institute of Technology*, Cambridge, MA.
Computer Science and Artificial Intelligence Laboratory.
- 07/19–01/20 **Research Intern**, *Google AI*, New York City, NY.
- 09/17–04/20 **Doctor of Philosophy**, *Stanford University*, Stanford, CA.
Electrical Engineering Department, Stanford Graduate Fellowship.
- 09/15–06/17 **Master of Science**, *Stanford University*, Stanford, CA.
Computer Science Department, Fulbright Fellowship.
- 10/11–04/15 **Bachelor of Science**, *Technical University of Munich*, Germany.
Electrical Engineering, degree awarded with high distinction (top 3% of class).

Fellowships and Awards

- 2020 **ECCV 2020 Outstanding Reviewer**.
- 2019 **NeurIPS Honorable Mention: Outstanding New Directions**.
- 2017–2020 **Stanford Graduate Fellowship**.
- 2016–2017 **Fellowship of the German Academic Exchange Service**.
- 2015–2017 **Full Fulbright Fellowship**.
- 2014 **Scholarship of the Lothar and Sigrid Rohde-Foundation**.
- 2013–2017 **Scholarship of the German National Academic Foundation**.
- 2013–2017 **Scholarship of the Max-Weber Program of Bavaria**.

Conference Publications

- C17 **Learning to Render Novel Views from Wide-Baseline Stereo Pairs**, Y. Du, C. Smith, A. Tewari, V. Sitzmann, 2023, IEEE Conference on Computer Vision and Pattern Recognition (CVPR).
- C16 **Seeing 3D Objects in a Single Image via Self-Supervised Static-Dynamic Disentanglement**, P. Sharma, A. Tewari, Y. Du, S. Zakharov, R. Ambrus, A. Gaidon, W. T. Freeman, F. Durand, J.B. Tenenbaum, V. Sitzmann, 2023, International Conference on Learning Representations (ICLR).

- C15 **Decomposing NeRF for Editing via Feature Field Distillation**, *S. Kobayashi, E. Matsumoto, V. Sitzmann*, 2022, Conference on Neural Information Processing Systems (NeurIPS).
- C14 **Neural Descriptor Fields: SE(3)-Equivariant Object Representations for Manipulation**, *A. Simeonov*, Y. Du*, A. Tagliasacchi, J.B. Tenenbaum, A. Rodriguez, P. Agrawal, V. Sitzmann*, 2022, International Conference on Robotics and Automation (ICRA).
- C13 **3D Neural Scene Representations for Visuomotor Control**, *Y. Li*, S. Li*, V. Sitzmann, P. Agrawal, A. Torralba*, 2021, Confence on Robotic Learning (CoRL).
- C12 **Kubric: A scalable dataset generator**, *K. Greff et al.*, 2012, Conference on Computer Vision and Pattern Recognition (CVPR).
- C11 **Neural Fields in Visual Computing and Beyond**, *Y. Xie, T. Takikawa, S. Saito, O. Litany, S. Yan, N. Khan, F. Tombari, J. Tompkin, V. Sitzmann, S. Sridhar*, 2022, Eurographics, State of the Art Report.
- C10 **Light Field Networks: Neural Scene Representation with Single-Evaluation Rendering**, *V. Sitzmann*, S. Rezchikov*, J. Tenenbaum, W. T. Freeman, F. Durand*, 2021, Conference on Neural Information Processing Systems (NeurIPS, spotlight).
- C9 **Learning Signal-Agnostic Implicit Manifolds**, *Y. Du, J. Tenenbaum, V. Sitzmann*, 2021, Conference on Neural Information Processing Systems (NeurIPS, poster).
- C8 **Single-Shot Scene Reconstruction**, *S. Zakharov, R. A. Ambrus, D. Park, V. Guizilini, W. Kehl, F. Durand, J. B. Tenenbaum, V. Sitzmann, J. Wu, A. Gaidon*, 2021, Confence on Robotic Learning (CoRL, Poster).
- C7 **Neural Scene Representations for Visuomotor Control**, *Yunzhu Li, Shuang Li, Vincent Sitzmann, Pulkit Agrawal, Antonio Torralba*, 2021, Conference on Robotic Learning (CoRL, Oral).
- C6 **Implicit Neural Representations with Periodic Activation Functions**, *V. Sitzmann*, J. Martel*, A. Bergman, D. Lindell, G. Wetzstein*, 2020, Conference on Neural Information Processing Systems (NeurIPS, oral).
- C5 **MetaSDF: Meta-Learning Signed Distance Functions**, *V. Sitzmann*, E. R. Chan*, R. Tucker, N. Snavely, G. Wetzstein*, 2020, Conference on Neural Information Processing Systems (NeurIPS, poster).
- C4 **Semantic Implicit Neural Scene Representations with Semi-supervised Training**, *A. Kohli*, V. Sitzmann*, G. Wetzstein*, 2020, International Conference on 3D Vision (3DV).
- C3 **State of the Art on Neural Rendering**, *A. Tewari et al.*, 2020, Eurographics, State of the Art Report.
- C2 **Scene Representation Networks: Continuous 3D-structure-aware Neural Scene Representations**, *V. Sitzmann, M. Zollhoefer, G. Wetzstein*, 2019, Conference on Neural Information Processing Systems (NeurIPS, oral, Outstanding New Directions Award).
- C1 **Deep Voxels: Learning Persistent 3D Feature Embeddings**, *V. Sitzmann, J. Thies, F. Heide, M. Niessner, G. Wetzstein, M. Zollhoefer*, 2019, IEEE Conference on Computer Vision and Pattern Recognition (CVPR, oral).

Journal Publications

- J7 **Unsupervised Discovery and Composition of Object Light Fields**, *C. Smith, H.X. Yu, S. Zakharov, F. Durand, J.B. Tenenbaum, J. Wu, V. Sitzmann*, 2021, Transactions on Machine Learning Research (TMLR).
- J6 **Dirty Pixels: Optimizing Image Classification Architectures for Raw Sensor Data**, *S. Diamond*, V. Sitzmann*, Frank Julca-Aguilar*, S. Boyd, G. Wetzstein, F. Heide*, 2021, ACM Transactions on Graphics.
- J5 **Hybrid optical-electronic convolutional neural networks with optimized diffractive op-tics for image classification**, *J. Chang, V. Sitzmann, X. Dun, W. Heidrich, G. Wetzstein*, 2018, Scientific Reports.
- J4 **End-to-end Optimization of Optics and Image Processing for Achromatic Extended Depth of Field and Super-resolution Imaging**, *V. Sitzmann*, S. Diamond*, Y. Peng*, X. Dun, S. Boyd, W. Heidrich, F. Heide, G. Wetzstein*, 2018, ACM Transactions on Graphics (SIGGRAPH).
- J3 **Saliency in VR: How do people explore virtual environments?**, *V. Sitzmann, A. Serrano, A. Pavel, M. Agrawala, D. Gutierrez, B. Masia, G. Wetzstein*, 2018, IEEE Transactions on Visualization and Computer Graphics (IEEE Virtual Reality).
- J2 **Towards a Machine-learning Approach for Sickness Prediction in Virtual Environments**, *N. Padmanaban, T. Ruban, V. Sitzmann, A. Norcia, G. Wetzstein*, 2018, IEEE Transactions on Visualization and Computer Graphics (IEEE Virtual Reality).
- J1 **Movie Editing and Cognitive Event Segmentation in Narrative Virtual Reality**, *A. Serrano, V. Sitzmann, J. Ruiz-Borau, G. Wetzstein, D. Gutierrez, B. Masia*, 2017, ACM Transactions on Graphics (SIGGRAPH).

Non-Refereed Publications

- NR4 **Diffusion with Forward Models: Solving Stochastic Inverse Problems Without Direct Supervision**, *A. Tewari*, T. Yin*, G. Cazenavette, S. Rezhikov, J.B. Tenenbaum, F. Durand, W. T. Freeman, V. Sitzmann*, 2023, arXiv.
- NR3 **FlowCam: Training Generalizable 3D Radiance Fields without Camera Poses via Pixel-Aligned Scene Flow**, *C. Smith, Y. Du, A. Tewari, V. Sitzmann*, 2023, arXiv:2306.00180.
- NR2 **Deep Medial Fields**, *D. Rebain, K. Li, V. Sitzmann, S. Yazdani, K.M. Yi, A. Tagliasacchi*, 2021, arXiv:2106.03804.
- NR1 **Unrolled Optimization with Deep Priors**, *S. Diamond*, V. Sitzmann*, F. Heide, G. Wetzstein*, 2017, arXiv:1705.08041.

Patents and Patent Applications

- 2022 **Patent Pending: SYSTEMS AND METHODS FOR RECONSTRUCTING A SCENE IN THREE DIMENSIONS FROM A TWO-DIMENSIONAL IMAGE.**
U.S. Pat. App. No. 17/696,490

- 2022 **Patent Pending: UNSUPERVISED DISCOVERY AND COMPOSITION OF OBJECT LIGHT FIELDS.**
U.S. Pat. App. No. 63/307,842

Tutorials and Workshops

- 06/23 **Generative Models for Computer Vision**, *CVPR 2023*.
06/22 **Neural Fields across Fields: Methods and Applications of Implicit Neural Representations**, *ICLR 2023*.
06/22 **Neural Fields in Computer Vision**, *CVPR 2022*.
03/22 **Neural Fields in Visual Computing and Beyond**, *Eurographics 2022*.
11/21 **Tutorial on the Advances in Neural Rendering**, *3DV 2021*.
08/21 **Learning 3D Representations for Shape and Appearance**, *ICCV 2021*.
08/20 **Learning 3D Representations for Shape and Appearance**, *ECCV 2020*.
07/20 **Neural Rendering**, *CVPR 2020*.
05/20 **State of the Art on Neural Rendering**, *Eurographics 2020*.

In the Media

- 2022 **A New Trick Lets Artificial Intelligence See in 3D**, *WIRED Magazine*.
<https://www.wired.com/story/new-way-ai-see-3d/>
2022 **An easier way to teach robots new skills**, *MIT News*.
<https://news.mit.edu/2022/teach-pick-robots-new-task-0425>
2021 **Technique enables real-time rendering of scenes in 3D**, *MIT News*.
<https://news.mit.edu/2021/3-d-image-rendering-1207>
2021 **On neural scene representations for computer vision and more general AI**,
Generally Intelligent Podcast.
<https://generallyintelligent.com/podcast/2021-05-19-podcast-episode-11-vincent-sitzmann/>

Teaching

- 2023 **6.8300/6.869/6.819: Advances in Computer Vision**, *MIT*.
2022 **6.S980: Machine Learning for Inverse Graphics**, *MIT*.
<https://www.scenerepresentations.org/courses/inverse-graphics/>

Keynotes, Invited Talks & Presentations

- 06/23 **CVPR 2023 Workshop on 3D Scene Understanding**, *Towards 3D Representation Learning at Scale*.
05/23 **Singapore Vision Day**, *Towards 3D Representation Learning at Scale*.
10/22 **ECCV 2022 Workshop on Frontiers of Monocular 3D Perception**, *Self-Supervised Scene Representation Learning*.
08/22 **Northwestern University, Seminar Computer Graphics/Photography**, *Self-Supervised Scene Representation Learning*.

- 08/22 **Computational Imaging Workshop, Google**, *Self-Supervised Scene Representation Learning*.
- 08/22 **Neural Rendering in Computer Vision Rank Symposium**, *Self-Supervised Scene Representation Learning*.
- 07/22 **International Computer Vision Summer School, ICVSS**, *Learning to Perceive the 3D World from 2D Images*.
- 07/22 **RSS Workshop on Implicit Representations for Robotic Manipulation**, *Self-supervised Scene Representation Learning for Robotics*.
- 05/22 **3D Neural Scene Representations Workshop, Google**, *Self-Supervised Scene Representation Learning*.
- 05/22 **Friedrich-Alexander-University of Erlangen-Nuremberg**, *Self-supervised Scene Representation Learning*.
- 04/22 **GRASP Seminar, University of Pennsylvania**, *Self-supervised Scene Representation Learning for Robotics*.
- 04/22 **Max-Planck Institute for Informatics**, *Self-supervised Scene Representation Learning*.
- 03/22 **Dagstuhl Seminar for Morphable Models**, *Self-supervised Scene Representation Learning*.
- 01/22 **MIT CSAIL Alliances**, *Self-supervised Scene Representation Learning*.
- 10/21 **University of California, Berkeley**, *Light Field Networks: Neural Scene Representations with Single-Evaluation Rendering*.
- 10/21 **Toyota Research**, *3D Scene Representation Learning*.
- 10/21 **Stanford University, course CS348I: Computer Graphics in the Era of AI**, *Guest lecture on Implicit Neural Scene Representations*.
- 10/21 **MIT, course 6s898: Deep Learning**, *Guest lecture on Implicit Neural Scene Representations*.
- 10/21 **ICCV, Workshop on Differentiable 3D Vision and Graphics**, *Invited Talk on Light Field Networks*.
- 07/21 **Toyota Research**, *Light Field Networks: Neural Scene Representations with Single-Evaluation Rendering*.
- 01/21 **Stanford Center for Image Systems Engineering (SCIEN) Talk Series**, *Self-Supervised Scene Representation Learning*.
- 01/21 **Preferred Networks, Inc.**, *Implicit Neural Scene Representations*.
- 08/20 **Stanford University, course CS348I: Computer Graphics in the Era of AI**, *Guest lecture on Implicit Neural Scene Representations*.
- 08/20 **University of Toronto, Machine Learning Group**, *Implicit Neural Scene Representations*.
- 08/20 **Oxford Visual Geometry Group**, *Implicit Neural Scene Representations*.
- 08/20 **Carnegie Mellon Vision and Autonomous Systems Seminar**, *Implicit Neural Scene Representations*.

- 07/20 **University of Bath, Visual Computing Group**, *Implicit Neural Scene Representations*.
- 07/20 **ICML 2020, Workshop for Object-Oriented Representations**, *Implicit Neural Scene Representations*.
- 07/20 **Autonomous Vision Group, Max Planck Institute**, *Implicit Neural Scene Representations*.
- 07/20 **Visual Computing Lab, Technical University of Munich**, *Implicit Neural Scene Representations*.
- 03/20 **Adobe Research**, *Self-supervised Scene Representation Learning*.
- 03/20 **Google DeepMind**, *Self-supervised Scene Representation Learning*.
- 01/20 **Apple Research**, *Self-supervised Scene Representation Learning*.
- 01/20 **Google AI**, *Self-supervised Scene Representation Learning*.
- 01/20 **NVIDIA Research**, *Self-supervised Scene Representation Learning*.
- 05/18 **Stanford Wearable Electronics Initiative Seminar**, *Saliency in VR*.
- 03/18 **SIGGRAPH 2018**, *Saliency in VR*.
- 03/18 **University of Tübingen, Graphics Department**, *Learning Domain-Specific Cameras*.
- 03/18 **Max-Planck Institute for Informatics, Graphics Department**, *Learning Domain-Specific Cameras*.

Students Supervised

- Graduate **Ana Dodik**, *MIT, 2022-*.
- Ishaan Preetam Chandratreya**, *MIT, 2023-*.
- Chonghyuk Song**, *MIT, 2023-*.
- Cameron Smith**, *MIT, 2023-*.
- David Charatan**, *MIT, 2022-*.
- George Cazenavette**, *MIT, 2022-*.
- Boyuan Chen**, *MIT, 2022-*.
- Sizhe Li**, *MIT, 2022-*.
- Yilun Du**, *MIT, 2020-*.
- Prafull Sharma**, *MIT, 2020-*.
- Eric Ryan Chan**, *Stanford University, 2020*.
- Alexander William Bergman**, *Stanford University, 2020*.
- Undergrad. **Katie Collins**, *MIT, 2020–2021*.
- Nikhil Murthy**, *MIT, 2020–2021*.
- Amit Pal Kohli**, *Stanford University, 2019–2020*, now Ph.D. at UC Berkeley.

Theses Committees Served

- Yen-Chen Lin**, *MIT, 2023*.
- Zhoutong Zhang**, *MIT, 2022*.

Shangzhe Wu, *University of Oxford*, 2022.

George Cazenavette, *CMU*, 2022.

My Theses

Doctoral Thesis.

title *Self-supervised Scene Representation Learning*
supervisor Prof. Gordon Wetzstein, Stanford University

Bachelor Thesis.

title *Plane Detection in SLAM Pointclouds for AR Applications*
supervisor Prof. Klaus Diepold, Technical University of Munich

Academic Service

Area Chair **ICCV 2023, CVPR 2023, LoG 2023.**

Reviewer **ECCV, NeurIPS, ToG, SIGGRAPH, SIGGRAPH Asia, ICLR, ICML, ICCV.**