Uday Kusupati

Ph.D. Candidate - Expected Jul 2025

School of Computer and Communication Sciences,

Swiss Federal Institute of Technology Lausanne (EPFL), Switzerland

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EDUCATION

Swiss Federal Institute of Technology Lausanne (EPFL) *Oct 2020 - Jul 2025*
Ph.D. in Computer Science, Advisor: Prof. Mark Pauly

The University of Texas at Austin *Aug 2018 - May 2020*
Master's in Computer Science, GPA: **4.0/4.0**

Indian Institute of Technology Bombay *Jul 2014 - May 2018*
B.Tech (Honours) in Computer Science and Engineering with Minor in Mathematics, GPA: **9.0/10.0**

PUBLICATIONS

7. **Computational Design of a Kit of Parts for Bending-Active Structures**
Uday Kusupati*, Quentin Becker*, Seiichi Suzuki, Mark Pauly
ACM Transactions on Graphics (SIGGRAPH Asia), 2024 (* joint first author)

6. **Semantic Shape Editing with Parametric Implicit Templates**
Uday Kusupati, Mathieu Gaillard, Jean-Marc Thiery, Adrien Kaiser
Proceedings of SIGGRAPH Conference Papers, 2024

5. **Computational Homogenization for Inverse Design of Surface-based Inflatables**
Yingying Ren, Julian Panetta, Seiichi Suzuki, **Uday Kusupati**, Florin Isvoranu, Mark Pauly
ACM Transactions on Graphics (SIGGRAPH North America), 2024

4. **RUM: Reconfigurable Umbrella Mesh**
Uday Kusupati, Florin Isvoranu, Seiichi Suzuki, Mark Pauly
Advances in Architectural Geometry (AAG), 2023

3. **Umbrella Meshes: Elastic Mechanisms for Freeform Shape Deployment**
Uday Kusupati*, Yingying Ren*, Julian Panetta, Florin Isvoranu, Davide Pellis, Tian Chen, Mark Pauly
ACM Transactions on Graphics (SIGGRAPH North America), 2022 (* joint first author)
Best Paper Award Honorable Mention

2. **Normal Assisted Stereo Depth Estimation**
Uday Kusupati, Shuo Cheng, Rui Chen, and Hao Su
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2020

1. **Learning 3D Human Pose from Structure and Motion**
Rishabh Dabral, Anurag Mundadha, **Uday Kusupati**, Safeer Afaque, Abhishek Sharma, and Arjun Jain
The European Conference on Computer Vision (ECCV), 2018.

RESEARCH EXPERIENCE

Geometric Computing Laboratory, EPFL *Oct 2020 - Present*
Ph.D. Candidate - Advisor: Prof. Mark Pauly Lausanne, CH

- Computational frameworks for design, optimization and rationalization of bending-active and deployable structures
- Inverse design and exploration of shape-morphing structures like umbrella meshes, inflatables and kirigami
- Designing reconfigurable and re-usable adaptations of deployable structures for sustainable architectural practices

Smart Geometry Processing Group *Aug 2024 - Oct 2024*
Visiting Researcher - Advisor: Prof. Niloy J. Mitra London, UK

- Exploring continuous adaptive shape representations for solving PDEs and simulation

Adobe Research *July 2022 - Sep 2022*
Research Intern - Advisors: Dr. Adrien Kaiser, Prof. Jean-Marc Thiery Paris, FR

- A novel approach for deforming meshes semantically by coupling parametric implicit templates

Media Analytics, NEC Laboratories America *May 2020 - Aug 2020*
Research Intern - Advisors: Dr. Buyu Liu, Prof. Manmohan Chandraker San Jose, CA

- A parametric representation for holistic indoor scene understanding and reconstruction (patent filed at the USPTO)

SU Lab, University of California San Diego *May 2019 - Aug 2019*
Visiting Researcher - Advisor: Prof. Hao Su San Diego, CA

- A deep-learning framework to captures an implicit understanding of surface normal information as well as enforce depth-normal consistency for improved stereo depth estimation

The University of Texas at Austin *Jan 2019 - May 2019*
Graduate Researcher - Advisor: Prof. Qixing Huang Austin, TX

- Leveraging language based supervision for 3D Human Pose estimation in noisy and ill-posed scenarios.
- An approach for topology aware single-view mesh reconstruction and polygon-based image segmentation.

Indian Institute of Technology Bombay *Jan 2017 - May 2018*
Undergraduate Researcher - Advisor: Prof. Siddhartha Chaudhuri Mumbai, IN

- Scene parsing and reconstruction with stochastic grammars and recursive neural networks.
- Inverse design of furniture optimized to specific affordance measures

Indian Institute of Technology Bombay *Jul 2017 - May 2018*
Undergraduate Researcher - Advisor: Prof. Arjun Jain Mumbai, IN

- A semi-supervised learning method using a structure-aware loss function along with a temporal network for 3D Human Pose Estimation in real-time

Samsung Research Korea *May 2017 - Jul 2017*
Research Intern - Advisor: Dr. Inkwon Choi Seoul, KR

- Worked on resource-efficient object recognition algorithms for an automated robot cleaner

DATASHAPE team, Inria Sophia Antipolis *May 2017 - Jul 2017*
Research Intern - Advisor: Dr. Jean-Daniel Boissonnat Sophia Antipolis, FR

- Worked on implementing a probabilistic approach to reduce algebraic complexity of Delaunay Triangulations

SELECTED AWARDS AND HONORS

- SIGGRAPH North America 2022 Technical Papers: **Best Paper Award** Honorable Mention *2022*
- EPFL IC Distinguished Service Award *2021, 2022*
- EPFL EDIC Fellowship *2020 - 2021*
- **All India Rank 11** in JEE Advanced (IIT-JEE) 2014 among 150,000 students qualified from 1.5 million *2014*
- **AP Grade** for exceptional performance in Engineering Graphics & Drawing, IIT Bombay *2014*
- KVPY Fellowship, Government of India *2013*

TALKS

- *Technical Paper Presenter*, **ACM SIGGRAPH North America 2024**, Denver, USA *2024*
- *Invited Speaker*, **University College London**, London, UK *2024*
- *Invited Speaker*, **University of Washington**, Seattle, USA *2024*
- *Invited Speaker*, **University of Edinburgh**, Ediburgh, Scotland *2024*
- *Paper Presenter*, **AAG 2023**, Stuttgart, Germany *2023*
- *Invited Technical Paper Presenter*, **IEEE VIS 2022**, Oklahoma City, USA *2022*
- *Contributed talks presenter*, **Graphyz 2**, Saline Royale d'Arc-et-Senans, France *2022*
- *Technical Paper Presenter*, **ACM SIGGRAPH North America 2022**, Vancouver, Canada *2022*
- *Paper Presenter*, **IEEE CVPR 2020**, Seattle, USA *2020*

PROFESSIONAL SERVICE

- Reviewer for ECCV *2024*
- Reviewer for Computer Graphics Forum *2023*
- Prefiltering graduate applications for the EPFL EDIC Committee *2023*
- Student Member on UT Austin CS Masters Admissions Committee *2020*
- Memberships Secretary, Cossonay Cricket Club, Switzerland *2024*

Teaching Experience

- **EPFL**
  - Geometric Computing (Fall 2021, 2022, 2024)
  - The GCMaker Project (Spring 2023)
  - Advanced information, computation and communication (Fall 2023)
  - Theory of Computation (Spring 2021, 2022)
- **UT Austin**
  - Computer Graphics (Spring 2020)
  - Natural Language Processing (Fall 2019)
  - Computer Graphics Honors (Spring 2019)
- **IIT Bombay**
  - Computer Programming and Utilisation (Spring 2018, Fall 2017)
  - Data Structures and Algorithms (Spring 2017)

Mentorship

- Antoine Tran (Masters student, EPFL), Topic: Latent Space Physical Simulation *Ongoing*
- Davor Dobrota (Masters student, EPFL), Topic: Inverse Design of Nonlinear Springs *Ongoing*
- Fabio Lourenco (Masters student, EPFL), Topic: Optimization of curve networks for Stretchable Implants *2024*
- Mathilde Simoni (Masters student, EPFL), Topic: Latent Space Physical Simulation *2024*
- Jae-Yoon Cha (Exchange student, EPFL), Topic: Shape Space of Tensioned Fabrics with Polygonal Patches *2023*
- Danila Zubko (Masters student, EPFL), Topic: Latent Space Physical Simulation *2023*
- Paul Keller (Masters student, EPFL), Topic: Actuation of Umbrella-Meshes *2022*
- Hang Yin (Undergraduate student, CMU), Topic: Interactive Surface Parametrization *2021*
- EPFL RAMP Mentor *2023, 2024*
- SIGGRAPH RCDC Gradschool Application Mentor *2021*
- SIGGRAPH RCDC Gradschool Application Mentor *2021*
- Department Academic Mentor, CSE, IIT Bombay *2017-18*