

Zhiyang (Frank) Dou

 frank-zy-dou.github.io

 frankzydou@gmail.com

 frankdou@mit.edu

 zhiyang0@connect.hku.hk

 zydou@seas.upenn.edu

 MIT, Stata Center (Bldg 32), Rm 331, 32 Vassar St, Cambridge, MA 02139, USA.

Bio. I am a PhD student at *the Massachusetts Institute of Technology (MIT)*, in the *Computer Science and Artificial Intelligence Laboratory (CSAIL)*, supervised by *Prof. Wojciech Matusik*. I am affiliated with the Computational Design and Fabrication Group and the Computer Graphics Group. I completed my Master of Philosophy (MPhil) degree in the Computer Graphics Group at *the University of Hong Kong (HKU)*, supervised by *Prof. Wenping Wang* and *Prof. Taku Komura*. I received my BEng degree with honors from *Shandong University*. My undergraduate research advisor was *Prof. Shiqing Xin*. I was a visiting student at *University of Pennsylvania's* Graphics Lab and the GRASP Lab.

Research Interests : Robotics, Physics-Based Simulation, Character Animation, Geometric Computing, Computer Graphics, 3D Vision, and Human Behavior Analysis.

Education

-
- | | |
|---------------------|---|
| Aug 2025 – | PhD in Computer Science, <i>Massachusetts Institute of Technology</i> |
| Oct 2023 – Mar 2025 | Visiting Student, <i>University of Pennsylvania</i> |
| Aug 2020 – Jul 2025 | MPhil in Vision & Graphics, <i>The University of Hong Kong</i> |
| Sep 2016 – Jun 2020 | BEng in Computer Science (Honours), <i>Shandong University</i> |

Research Work

*Equal Contribution, # Corresponding Authors.

Selected Publications :

30. **Dynamic Realms : 4D Content Analysis, Recovery and Generation with Geometric, Topological and Physical Priors**
Zhiyang Dou.
 ECCV 2024 Doctoral Consortium.  EUROGRAPHICS 2025 Doctoral Consortium.

[Physics-based Agent Control]

29. **CFC : Simulating Character-Fluid Coupling using a Two-Level World Model**
Zhiyang Dou*, Chen Peng*, Xinyu Lu, Xiaohan Ye, Lixing Fang, Yuan Liu, Wenping Wang, Chuang Gan, Lingjie Liu, Taku Komura.
 ACM Transactions on Graphics. SIGGRAPH Asia 2025.
28. **CBIL : Collective Behavior Imitation Learning for Fish from Real Videos**
Yifan Wu*, Zhiyang Dou*, Yuko Ishiwaka, Shun Ogawa, Yuke Lou, Wenping Wang, Lingjie Liu, Taku Komura.
 ACM Transactions on Graphics. SIGGRAPH Asia 2024.
[Project Page]
27. **C-ASE : Learning Conditional Adversarial Skill Embeddings for Physics-based Characters**
Zhiyang Dou, Xuelin Chen, Qingnan Fan, Taku Komura, Wenping Wang.
 SIGGRAPH Asia 2023.
[Project Page][Paper][Video]
26. **TokenHSI : Unified Synthesis of Physical Human-Scene Interactions through Task Tokenization**
Liang Pan, Zeshi Yang, Zhiyang Dou, Wenjia Wang, Buzhen Huang, Bo Dai, Taku Komura, Jingbo Wang.
 CVPR 2025 (Oral).
[Project Page][Paper][Code]
25. **ModSkill : Physical Character Skill Modularization**
Yiming Huang, Zhiyang Dou, Lingjie Liu.
 ICCV 2025.
[Project Page][Paper]
24. **SIMS : Simulating Human-Scene Interactions with Real World Script Planning**
Wenjia Wang, Liang Pan, Zhiyang Dou, Zhouyingcheng Liao, Yuke Lou, Lei Yang, Jingbo Wang, Taku Komura.
 ICCV 2025.
[Project Page][Paper][Code]

[Human Motion Synthesis & Motion Capture & Mesh Recovery]

23. **MOSPA : Human Motion Generation Driven by Spatial Audio**
Shuyang Xu*, Zhiyang Dou*#, Mingyi Shi, Liang Pan, Leo Ho, Jingbo Wang, Yuan Liu, Cheng Lin, Yuexin Ma, Wenping Wang#, Taku Komura#.
 NeurIPS 2025. (Spotlight)

22. **Text2Interact : High-Fidelity and Diverse Text-to-Two-Person Interaction Generation**
Qingxuan Wu, Zhiyang Dou, Chuan Guo, Yiming Huang, Qiao Feng, Bing Zhou, Jian Wang, Lingjie Liu.
 ICLR 2026.
[Paper]
21. **DICE : End-to-end Deformation Capture of Hand-Face Interactions from a Single Image**
Qingxuan Wu, Zhiyang Dou#, Sirui Xu, Soshi Shimada, Chen Wang, Zhengming Yu, Yuan Liu, Cheng Lin, Zeyu Cao, Taku Komura, Vladislav Golyanik, Christian Theobalt, Wenping Wang, Lingjie Liu#.
 ICLR 2025.
[Project Page][Paper][Code]
20. **TORÉ : Token Reduction for Efficient Human Mesh Recovery with Transformer**
Zhiyang Dou*, Qingxuan Wu*, Cheng Lin, Zeyu Cao, Qiangqiang Wu, Weilin Wan, Taku Komura, Wenping Wang.
 ICCV 2023.
[Project Page][Paper][Code]
19. **EMDM : Efficient Motion Diffusion Model for Fast, High-Quality Human Motion Generation**
Wenyang Zhou, Zhiyang Dou#, Zeyu Cao, Zhouyingcheng Liao, Jingbo Wang, Wenjia Wang, Yuan Liu, Taku Komura, Wenping Wang, Lingjie Liu.
 ECCV 2024.
[Project Page][Paper][Code]
18. **TLControl : Trajectory and Language Control for Human Motion Synthesis**
Weilin Wan, Zhiyang Dou, Taku Komura, Wenping Wang, Dinesh Jayaraman, Lingjie Liu.
 ECCV 2024.
[Project Page][Paper][Code]

[Physics Modeling and Reconstruction]

17. **Vid2Sim : Generalizable, Video-based Reconstruction of Appearance, Geometry and Physics for Mesh-free Simulation**
Chuhao Chen, Zhiyang Dou, Chen Wang, Yiming Huang, Anjun Chen, Qiao Feng, Jiatao Gu, Lingjie Liu.
 CVPR 2025.

[Geometric Computing]

16. **Coverage Axis : Inner Point Selection for 3D Shape Skeletonization**
Zhiyang Dou, Cheng Lin, Rui Xu, Lei Yang, Shiqing Xin, Taku Komura, Wenping Wang.
 Computer Graphics Forum. EUROGRAPHICS 2022.
Top Cited Article in CGF 2022-2023. Fast-Forward Attendees Award, 2nd Place.
[Project Page][Code]
15. **Coverage Axis++ : Efficient Inner Point Selection for 3D Shape Skeletonization**
Zimeng Wang*, Zhiyang Dou*, Rui Xu, Cheng Lin, Yuan Liu, Xiaoxiao Long, Shiqing Xin, Taku Komura, Xiaoming Yuan, Wenping Wang.
A follow-up of Coverage Axis.
 Computer Graphics Forum. ACM SIGGRAPH/Eurographics SGP 2024.
[Project Page][Paper][Code]
14. **KISSColor : Kinetic and Intuitive Stroke Stretching for Vector Drawing Colorization**
Yiming Dong*, Hongxu Xin*, Zhiyang Dou#, Rui Xu, Yuan Liu, Shuangmin Chen, Shiqing Xin, Changhe Tu#, Taku Komura, Wenping Wang.
 ACM Transactions on Graphics. SIGGRAPH Asia 2025.
13. **Globally Consistent Normal Orientation for Point Clouds by Regularizing the Winding-Number Field**
Rui Xu, Zhiyang Dou, Ningna Wang, Shiqing Xin, Xiaohu Guo, Wenping Wang.
 ACM Transactions on Graphics. SIGGRAPH 2023.
SIGGRAPH 2023 Best Paper Award.
[Project Page][Code]
12. **Top-Down Shape Abstraction Based on Greedy Pole Selection**
Zhiyang Dou, Shiqing Xin, Rui Xu, Jian Xu, Yuanfeng Zhou, Shuangmin Chen, Wenping Wang, Xiuyang Zhao, Changhe Tu.
 IEEE Transactions on Visualization and Computer Graphics 2021.

[Shape Generation & Shape Reconstruction & 4D Reconstruction]

11. **WonderHuman : Hallucinating Unseen Parts in Dynamic 3D Human Reconstruction**
Zilong Wang, Zhiyang Dou#, Yuan Liu, Cheng Lin, Xiao Dong, Yunhui Guo, Chenxu Zhang, Xin Li, Wenping Wang, Xiaohu Guo#.
 IEEE Transactions on Visualization and Computer Graphics 2025.
[Project Page][Paper][Code]
10. **Surf-D : High-Quality Surface Generation for Arbitrary Topologies using Diffusion Models**
Zhengming Yu*, Zhiyang Dou*, Xiaoxiao Long, Cheng Lin, Zekun Li, Yuan Liu, Norman Müller, Taku Komura,

Marc Habermann, Christian Theobalt, Xin Li, Wenping Wang.

 ECCV 2024.

[\[Project Page\]](#)[\[Paper\]](#)[\[Code\]](#)

9. **Disentangled Clothed Avatar Generation from Text Descriptions**

Jionghao Wang, Yuan Liu, **Zhiyang Dou**, Zhengming Yu, Yongqing Liang, Xin Li, Wenping Wang, Rong Xie, Li Song.

 ECCV 2024.

[\[Project Page\]](#)[\[Paper\]](#)[\[Code\]](#)

8. **Align3R : Aligned Monocular Depth Estimation for Dynamic Videos**

Jiahao Lu*, Tianyu Huang*, Peng Li, **Zhiyang Dou**, Cheng Lin, Zhiming Cui, Zhen Dong, Sai-Kit Yeung, Wenping Wang, Yuan Liu.

 CVPR 2025 ([Highlight](#)).

[\[Project Page\]](#)[\[Paper\]](#)[\[Code\]](#)

7. **Wonder3D++ : Cross-domain Diffusion for High-fidelity 3D Generation from a Single Image**

Yuxiao Yang, Xiaoxiao Long, **Zhiyang Dou**, Cheng Lin, Yuan Liu, Qingsong Yan, Yuexin Ma, Haoqian Wang, Zhiqiang Wu, Wei Yin.

 IEEE Transactions on Pattern Analysis and Machine Intelligence 2025.

6. **Wonder3D : Single Image to 3D using Cross-Domain Diffusion**

Xiaoxiao Long*, Yuanchen Guo*, Cheng Lin, Yuan Liu, **Zhiyang Dou**, Lingjie Liu, Yuexin Ma, Song-Hai Zhang, Marc Habermann, Christian Theobalt, Wenping Wang.

 CVPR 2024 ([Highlight](#)).

[\[Project Page\]](#)[\[Paper\]](#)[\[Code\]](#)

[LLM Reasoning]

5. **AutoPSV : Automated Process-Supervised Verifier**

Jianqiao Lu, **Zhiyang Dou**, Hongru Wang, Zeyu Cao, Jianbo Dai, Yingjia Wan, Zhijiang Guo.

 NeurIPS 2024.

[\[Paper\]](#)[\[Code\]](#)

[Human Behavior Analysis]

4. **Popularization of High-Speed Railway Reduces the Infection Risk via Close Contact Route during Journey**

Nan Zhang, Xiyue Liu, Shuyi Gao, Boni Su, **Zhiyang Dou**#.

Sustainable Cities and Society 2023.

[\[Paper\]](#)

3. **Student Close Contact Behavior and COVID-19 Transmission in China's Classrooms**

Yong Guo*, **Zhiyang Dou***, Nan Zhang, Xiyue Liu, Boni Su, Yuguo Li, Yiping Zhang.

 PNAS Nexus 2023.

[Featured in a press release by EurekAlert!](#)

[\[Project Page\]](#)[\[Paper\]](#)[\[Press Release\]](#)

2. **Close Contact Behaviors of University and School Students in 10 Typical Indoor Environments**

Nan Zhang, Li Liu, **Zhiyang Dou**, Xiyue Liu, Xueze Yang, Yong Guo, Silan Gu, Yuguo Li, Hua Qian, Jianjian Wei.

Journal of Hazardous Materials 2023.

1. **Close Contact Behavior-based COVID-19 Transmission and Interventions in a Subway System**

Xiyue Liu*, **Zhiyang Dou***, Lei Wang, Boni Su, Tianyi Jin, Yong Guo, Jianjian Wei, Nan Zhang.

Journal of Hazardous Materials 2022.

 **Awards, Scholarships and Honors**

- > Jul 2024 Top Cited Article in CGF 2022-2023.
- > Oct 2023 The Best Paper Award, SIGGRAPH 2023.
- > Oct 2020 Postgraduate Scholarship.
- > Oct 2019 National Scholarship (0.2%).
- > Dec 2018 Presidential Scholarship (top 30 at the University).
- > Oct 2018 National Scholarship (0.2%).

 **Services**

- > **Reviewer Services** : SIGGRAPH; SIGGRAPH ASIA; ACM TOG; EUROGRAPHICS; TVCG; ICCV; CVPR; ECCV; ICLR; NeurIPS; PG; Pattern Recognition; Neural Networks; GM; CAD (CADJ); GMP; 3DV; AAAI; TMM; ACM Multimedia; CVM; CVPRW; ECCVW; NeurIPSW; TIP; TCSVT; CGI; SIGGRAPH Poster; Graphics Replicability Stamp; COMPUT J; ICONIP; FSDM; MLIS; Sustainable Cities and Society (SCS); Scientific (BrainSTEM@HKU).
Program Committee & Evaluation Committee : CGI 2025; Graphics Replicability Stamp.

- > **2024 - 2025** MIT Ashdown House Officer (Coffee Hour).
- > **2023 - 2024** Teaching Assistant of COMP3271 Computer Graphics.
- > **2022 - 2023** Teaching Assistant of COMP3362 Hands-on AI : Experimentation and Applications.
- > **2021 - 2022** Teaching Assistant of COMP3362 Hands-on AI : Experimentation and Applications.
- > **2020 - 2021** Teaching Assistant of COMP2120 Computer organization.
- > **2021 - 2022** Junior Resident Tutor at [Graduate House](#).
- > **2018 - 2019** Co-founder of Open Interest Lab (IPLab) at SDU (By 2022, we have more than 120 members).

Research Experience

- > **Oct. 2023 - May. 2024** Visiting Scholar, [University of Pennsylvania](#).
- > **Jul. 2023 - Nov. 2023** Research Intern, [Tencent Games](#).
- > **Apr. 2022 - Jun. 2023** Research Intern, [Tencent AI Lab](#).
- > **Jul. 2019 - Oct. 2019** Research Assistant, [The University of Hong Kong](#).
- > **Mar. 2018 - Jun. 2019** Research Assistant (part-time), [Interdisciplinary Research Center \(IRC\)](#).

Patents & Competitions

- > **Patent-** JP7786689 Collective Behavior Imitation Learning for Fish from Real Videos, 2024.
- > **Patent-** CN116959095A Training method, device, equipment, storage medium and product of motion prediction model, 2023.
- > **Patent-** CN113111743A Personnel distance detection method and device, 2021.
- > **Meritorious Winner**, [International Mathematical Modeling Contest](#) : MCM, 2019.
- > **Meritorious Winner**, [International Mathematical Modeling Contest](#) : ICM, 2018.
- > **National First Prize (1%)**, [National Collegiate Mathematical Modeling Contest](#), 2019.
- > **National First Prize, Best Paper (8/38573)**, [National Collegiate Mathematical Modeling Contest](#), 2018.

Talks

- > **Mar. 2026.**
MOSPA : Human Motion Generation Driven by Spatial Audio, *AI/ML and Computer Vision Meetup (Voxel51)*.
- > **Jul. 2025.**
From Static 3D Geometry to Dynamic 4D Contents : Analysis, Recovery, and Generation, *China Society of Image and Graphics*.
Physics-based Character Animation and Simulation Platform (On behalf of HKU CGVU Lab), *ChinaSI*.
On Efficient, Controllable, and Physically Plausible Motion Synthesis, *University of Science and Technology of China*.
Physics-based Motion Control, *University of Science and Technology of China*.
On Efficient, Controllable, and Physically Plausible Motion Synthesis, *Zhejiang University*.
- > **Jun. 2025.**
From Static 3D Geometry to Dynamic 4D Contents : Analysis, Recovery, and Generation, *VALSE*.
- > **May. 2025.**
Toward Fully Automated 4D Content Creation : Challenges and Future Directions, *Stealth Startup*.
Principles and Practices for Efficient, Controllable, and Physically Plausible Motion Synthesis, *MiHoYo*.
On Efficient, Controllable, and Physically Plausible Motion Synthesis, *The Hong Kong Polytechnic University*.
On Efficient, Controllable, and Physically Plausible Motion Synthesis, *Stealth Startup*.
From Static 3D Geometry to Dynamic 4D Contents : Analysis, Recovery, and Generation, *EUROGRAPHICS DC*.
- > **Apr. 2025.**
Human-Centric Spatial AI for Close Contact Behavior Analysis, *Beijing University of Technology*.
On Efficient, Controllable, and Physically Plausible Motion Synthesis, *Shandong University*.
From Static 3D Geometry to Dynamic 4D Contents : Analysis, Recovery, and Generation, *BAAI*.
- > **Mar. 2025.**
Human-Centric Spatial AI for Close Contact Behavior Analysis, *Beijing University of Technology*.
- > **Feb. 2025.**
World Models for Physical Agent Control, *Honda Research (GRASP Lab Visit)*.
On Efficient, Controllable, and Physically Plausible Motion Synthesis, *Technion*.
- > **Dec. 2024.**
On Efficient, Controllable, and Physically Plausible Motion Synthesis, *NVIDIA*.

- Towards a Universal Motion Foundation Model, *Stealth Startup*.
- > **Oct. 2024.**
On Efficient, Controllable, and Physically Plausible Motion Synthesis, *Meta*.
Research Sharing, *Shandong University*.
Addressing the Challenge of Data Scarcity in Motion Synthesis, *Shanghai AI Lab*.
On Efficient, Controllable, and Physically Plausible Motion Synthesis, *ShanghaiTech University*.
On Efficient, Controllable, and Physically Plausible Motion Synthesis, *ChinaGraph*.
 - > **Aug. 2024.**
On Efficient, Controllable, and Physically Plausible Motion Synthesis, *MiHoYo*.
 - > **Apr. 2024.**
On the Readily Deployable System for Detecting Close Contact Behaviors, *Boeing*.
 - > **Dec. 2023.**
Shape Analysis, Recovery and Generation with Geometric and Topological Priors, *Stealth Startup*.
 - > **Nov. 2023.**
Geometric Computing - Medial Axis Transform and Normal Orientation for Point Clouds, *ShanghaiTech University*.
 - > **Oct. 2023.**
Scalable Skill Embeddings for Physics-based Characters, *Tencent Games*.
 - > **Jun. 2023.**
Robust and Efficient Vision Systems for Close Contact Behavior Analysis, *Beijing University of Technology*.
 - > **Feb. 2023.**
Scalable Skill Embeddings for Physics-based Characters, *Shandong University*.
 - > **Oct. 2022.**
On Efficient Hand-to-Surface Contact Estimation, *Boeing*.

☰ Student Mentorship Experience

(Sorted alphabetically by last name.)

- > Jamie Zeyu Cao, University of Cambridge (BA), University of Cambridge (MS), University of Cambridge (PhD).
- > Ryan Chaiyakul, University of California, Los Angeles (BS), University of California, Los Angeles (MS).
- > Chuhao Chen, Tsinghua University (BEng), University of California San Diego (MS), University of Pennsylvania (RA, PhD).
- > Yuxin Dai, Zhejiang A&F University (BEng), Texas A&M University (PhD).
- > Yiming Dong, Shandong University (BEng, MEng).
- > Victor Yuming Feng, Imperial College London (BS).
- > Yiming Huang, NYU Shanghai (BEng), University of Pennsylvania (MS & PhD).
- > Haodong Li, Zhejiang University (BEng), HKUST(GZ) (MEng).
- > Xiyue Liu, Beijing University of Technology (BEng), Beijing University of Technology (MEng).
- > John Onyemelukwe, Massachusetts Institute of Technology (BEng).
- > Sooa Park, The University of Hong Kong (BEng).
- > Patt Phurtivilai, The University of Hong Kong (BEng).
- > Huaijin Pi, Zhejiang University (BEng, MEng), The University of Hong Kong (PhD).
- > Nithasree Somanathan, Ramaiah Institute of Technology (BEng), University of Pennsylvania (MS).
- > Zilong Wang, The University of Texas at Dallas (PhD).
- > Zixin Wang, University of Massachusetts at Amherst (MS).
- > Akihisa Watanabe, Waseda University (BEng), Waseda University (Graduate Student).
- > Peter Qingxuan Wu, University of Oxford (BA), University of Pennsylvania (MS).
- > Yifan Wu, Yangzhou University (BS), Boston University (MS), The University of Hong Kong (RA), Tencent.
- > Rui Xu, Shandong University (BEng), Shandong University (MEng), The University of Hong Kong (PhD).
- > Shuyang Xu, The University of Hong Kong (BEng), The University of Hong Kong (MPhil).
- > Haozhe Yang, The University of Hong Kong (BEng).
- > Zhengming Yu, South China University of Technology (BEng), Texas A&M University (PhD).
- > Hangxing Zhang, ShanghaiTech University (BEng), Harvard University (Visiting Undergrad).
- > Libo Zhang, Tsinghua University (BEng & BS), Tsinghua University (PhD).
- > Tingyang Zhang, Peking University (BS), Anuttacon.

- > Wuqiang Zheng, University of Science and Technology of China (BS).
- > Andy Wenyang Zhou, University of Cambridge (BA).