Reference List for 15-464 / 15-664   February 27, 2023

Following paper presentations today, we took a look at some recent research in cloth and contact.

Cloth

I began by showing a couple of recent papers that aim for the appearance of yarn level cloth simulation, but at greater speed:

Sperl, Georg, Rahul Narain, and Chris Wojtan. "Homogenized yarn-level cloth." *ACM Transactions on Graphics (TOG)* 39, no. 4 (2020): 48
https://visualcomputing.ist.ac.at/publications/2020/HYLC/

Sperl, Georg, Rosa M. Sánchez-Banderas, Manwen Li, Chris Wojtan, and Miguel A. Otaduy. "Estimation of yarn-level simulation models for production fabrics." *ACM Transactions on Graphics (TOG)* 41, no. 4 (2022): 1-15.
https://mslab.es/projects/YarnLevelFabrics/

I then showed an assortment of other recent research.   This paper performs multi-layer avatar and clothing capture:

Yu, Tao, Zerong Zheng, Yuan Zhong, Jianhui Zhao, Qionghai Dai, Gerard Pons-Moll, and Yebin Liu. "Simulcap: Single-view human performance capture with cloth simulation." In *Proceedings of the IEEE/CVF conference on computer vision and pattern recognition*, pp. 5504-5514. 2019. https://arxiv.org/abs/1903.06323
https://www.youtube.com/watch?v=rTdz3saGKsQ

This paper predicts clothing motion as a function of pose and garment style:

Patel, Chaitanya, Zhouyingcheng Liao, and Gerard Pons-Moll. "Tailornet: Predicting clothing in 3d as a function of human pose, shape and garment style." In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*, pp. 7365-7375. 2020. https://virtualhumans.mpi-inf.mpg.de/tailornet/

This one uses virtual bones to aid learning to predict dynamic clothing motions:

Pan, Xiaoyu, Jiaming Mai, Xinwei Jiang, Dongxue Tang, Jingxiang Li, Tianjia Shao, Kun Zhou, Xiaogang Jin, and Dinesh Manocha. "Predicting loose-fitting garment deformations using bone-driven motion networks." In *ACM SIGGRAPH 2022 Conference Proceedings*, pp. 1-10. 2022.
https://www.nextstudios.com/news/en/?url=/_news/en/202208/1.html

In a previous class, we mentioned Marvelous Designer
https://www.marvelousdesigner.com/

This work came out of the research of Seungwoo Oh, who founded CLO Virtual Fashion, which launched Marvelous Designer in 2012.   You can browse his research works here:
https://www.researchgate.net/scientific-contributions/Seungwoo-Oh-70595950

Contact

For contact resolution, we briefly looked at results from the following series of papers, which deal with creating intersection-free contact for complex systems at reasonable computation speeds:

Li, Minchen, Zachary Ferguson, Teseo Schneider, Timothy R. Langlois, Denis Zorin, Daniele Panozzo, Chenfanfu Jiang, and Danny M. Kaufman. "Incremental potential contact: intersection-and inversion-free, large-deformation dynamics." *ACM Trans. Graph.* 39, no. 4 (2020): 49. https://ipc-sim.github.io/

Ferguson, Zachary, Minchen Li, Teseo Schneider, Francisca Gil-Ureta, Timothy Langlois, Chenfanfu Jiang, Denis Zorin, Danny M. Kaufman, and Daniele Panozzo. "Intersection-free rigid body dynamics." *ACM Transactions on Graphics* 40, no. 4 (2021).   https://ipc-sim.github.io/rigid-ipc/

Lan, Lei, Danny M. Kaufman, Minchen Li, Chenfanfu Jiang, and Yin Yang. "Affine body dynamics: Fast, stable & intersection-free simulation of stiff materials." *ACM Trans. Graph.* 41, no. 4 (2022). https://www.math.ucla.edu/~minchen/