

## 15-464/15-664 Reference List for April 8, 2019

We looked at a sequence of four recent papers on the topic of modeling and simulating the human body.

The first paper used a data driven approach to obtain simulation parameters for a finite element model of the body.

Kim, Meekyoung, Gerard Pons-Moll, Sergi Pujades, Seungbae Bang, Jinwook Kim, Michael J. Black, and Sung-Hee Lee. "Data-driven physics for human soft tissue animation." *ACM Transactions on Graphics (TOG)* 36, no. 4 (2017): 54.

<https://ps.is.tuebingen.mpg.de/publications/meekyoung-siggraph>

The second applied an inner volumetric muscle model to facilitate growing a range of body types, all of which could be physically simulated.

Saito, Shunsuke, Zi-Ye Zhou, and Ladislav Kavan. "Computational bodybuilding: Anatomically-based modeling of human bodies." *ACM Transactions on Graphics (TOG)* 34, no. 4 (2015): 41.

<https://www.cs.utah.edu/~ladislav/saito15computational/saito15computational.html>

The third used a custom probe to measure skin deformation properties at various points of the body and utilized a sliding puck representation of body material to some depth under the skin.

Pai, Dinesh K., Austin Rothwell, Pearson Wyder-Hodge, Alistair Wick, Ye Fan, Egor Larionov, Darcy Harrison, Debanga Raj Neog, and Cole Shing. "The human touch: measuring contact with real human soft tissues." *ACM Transactions on Graphics (TOG)* 37, no. 4 (2018): 58.

<https://sensorimotor.cs.ubc.ca/2018/08/02/measuring-contact-with-real-human-bodies/>

The fourth developed and tested a 4 degree-of-freedom model of the human foot and showed its effectiveness for simulated balance situations.

Park, Hwangpil, Ri Yu, and Jehee Lee. "Multi-segment foot modeling for human animation." In *Proceedings of the 11th Annual International Conference on Motion, Interaction, and Games*, p. 16. ACM, 2018.

<http://mrl.snu.ac.kr/research/ProjectHumanFoot/humanfoot.htm>

During class, I mentioned two related papers which I could not find. Here is the first, which shows transfer of anatomical models to all sorts of characters and body types.

Ali-Hamadi, Dicko, Tiantian Liu, Benjamin Gilles, Ladislav Kavan, François Faure, Olivier Palombi, and Marie-Paule Cani. "Anatomy transfer." *ACM Transactions on Graphics (TOG)* 32, no. 6 (2013): 188.

<https://www.cs.utah.edu/~ladislav/alihamadi13anatomy/alihamadi13anatomy.html>

The second, which represents Prof. Dinesh Pai's early use of probes to extract deformation properties is here. Be sure to check out the video.

Pai, Dinesh K., Kees van den Doel, Doug L. James, Jochen Lang, John E. Lloyd, Joshua L. Richmond, and Som H. Yau. "Scanning physical interaction behavior of 3D objects." In *Proceedings of the 28th annual conference on Computer graphics and interactive techniques*, pp. 87-96. ACM, 2001.

<http://www.graphics.cornell.edu/pubs/2001/PvdDJ+01.html>