Parameterize the Generation of Realistic Faces

Jakob Fehle, David Halbhuber, Jonathan Sasse
Lehrstuhl Medieninformatik
FAKULTÄT FÜR SPRACH-, LITERATUR- UND KULTURWISSENSCHAFTEN

Universität Regensburg

Halbhuber, Fehle, Sasse
Lehrstuhl Medieninformatik
FAKULTÄT FÜR SPRACH-, LITERATUR- UND KULTURWISSENSCHAFTEN

Background

- generation of realistic faces ongoing problem
- need for better self-presentation
- 3 approaches for modeling
  - parameter model
  - physiological muscle model
  - visual modeling based on images

Previous work

- FaceMaker: tool for generating parameterized face models

- Generative Adversarial Networks (GANs)
  - "Generative" part (Generator): using a label to predict a feature
  - "Adversarial" part (Discriminator): using a feature to predict a label
  - both parts are learning and improving through feedback loops

Halbhuber, Fehle, Sasse
Lehrstuhl Medieninformatik
FAKULTÄT FÜR SPRACH-, LITERATUR- UND KULTURWISSENSCHAFTEN

Research question

- generate paired samples: artificial faces and corresponding real face

- use data for tuning and improving GANs' results

- validate model by comparing generated (by participants) and realistic faces

Deep Labeling of Motion Capturing Markers

Jakob Fehle, David Halbhuber, Jonathan Sasse
Lehrstuhl Medieninformatik
FAKULTÄT FÜR SPRACH-, LITERATUR- UND KULTURWISSENSCHAFTEN

Universität Regensburg

Background

- Body motions get captured with markers/sensors and cameras

- Markers transmit signals either actively or passively

- Labeling of those markers is either time-consuming work or must be automated with software

Previous work

- Initialization of the persons skeleton before tracking is important [1,2]

- For the calculation of the skeleton and the labeling of the markers, better results could be achieved by using more than just information from the last frame [3]

[1] Meyer, J., Kuderer, M., Müller, J., & Burgard, W. (2014). Online marker labeling for fully automatic skeleton tracking in optical motion capture.
[2] Han, S., Liu, B., Wang, R., Ye, Y., Twigg, C. D., & Kin, K. (2018). Online Optical Marker-based Hand Tracking with Deep Labels.
[3] Yu, Q., Li, Q., & Deng, Z. (2007). Online Motion Capture Marker Labeling for Multiple Interacting Articulated Targets.

Research question

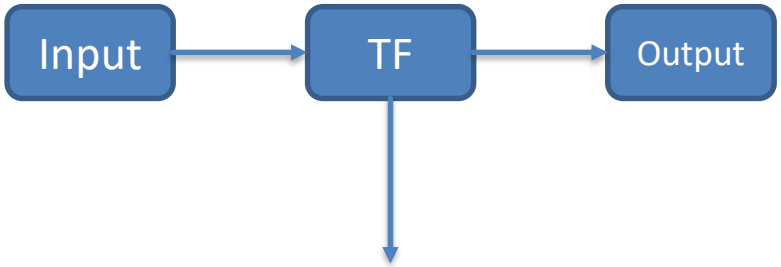
Can an approach based on convolutional neural networks in the automatic labeling of whole bodies yield results comparable to old fashioned methods?

Optimizing mouse transfer function using reinforcement learning

Jakob Fehle, David Halbhuber, Jonathan Sasse
Lehrstuhl Medieninformatik
FAKULTÄT FÜR SPRACH-, LITERATUR- UND KULTURWISSENSCHAFTEN

Universität Regensburg

Background



- Mapping movement in real world space to computer space representation

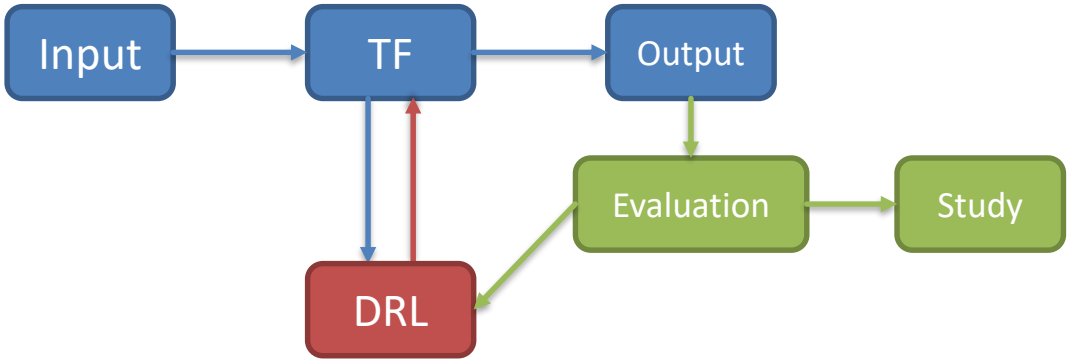
Previous work

- Has shown that the use of the default TF in common os is superior to constant CD-Gain [1]

- DRL is promising in solving certain task, without prior knowledge about the data [2],[3]

[1] Casiez, G., Vogel, D., Balakrishnan, R., & Cockburn, A. (2008). The impact of control-display gain on user performance in pointing tasks. Human–computer interaction, 23(3), 215-250.
[2] Mnih, V., Kavukcuoglu, K., Silver, D., Graves, A., Antonoglou, I., Wierstra, D., & Riedmiller, M. (2013). Playing atari with deep reinforcement learning. arXiv preprint arXiv:1312.5602.
[3] Silver, D., Huang, A., Maddison, C. J., Guez, A., Sifre, L., Van Den Driessche, G., ... & Dieleman, S. (2016). Mastering the game of Go with deep neural networks and tree search. nature, 529(7587), 484.

Research question



- Is it possible to design a TF via DRL to increase UX and user perfomance in certain tasks?