



Anime-Like Motion Transfer with Optimal Viewpoints



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Problem

In anime, *nakawari* technique has been established to adaptively select poses to make a character's motion visually attractive. In 3D animation, redundancy of real motions makes it difficult to reproduce anime-like motions only by uniform downsampling.

Related Work

Miura et al. [1] select keyposes with a focus on motion speeds, but this method is not suitable for identifying a sequence of poses for in-betweens.

Kitamura et al. [2] emphasize motions by omitting much of the high-speed parts. Because this method applies downsampling to all but the fast frames, the entire animation still represents real motions.

Solution

We propose a method for converting mocap data into anime-like motions respecting the *nakawari* technique. To evaluate motion characteristics quantitatively, we rely on the time distributions of speeds and pose areas of a human character, and we simultaneously select effective viewpoints and extract poses for each of the viewpoints.

References

- [1] Takeshi Miura, et al. 2014. Adaptive Keypose Extraction from Motion Capture Data. *Journal of Information Processing* 22, 1 (2014), 67–75. DOI:10.2197/ipsjip.22.67
- [2] Maki Kitamura, et al. 2013. Motion Frame Omission for Cartoon-like Effects. In *Proceedings of International Workshop on Advanced Image Technology (IWAIT)*. 148–152.

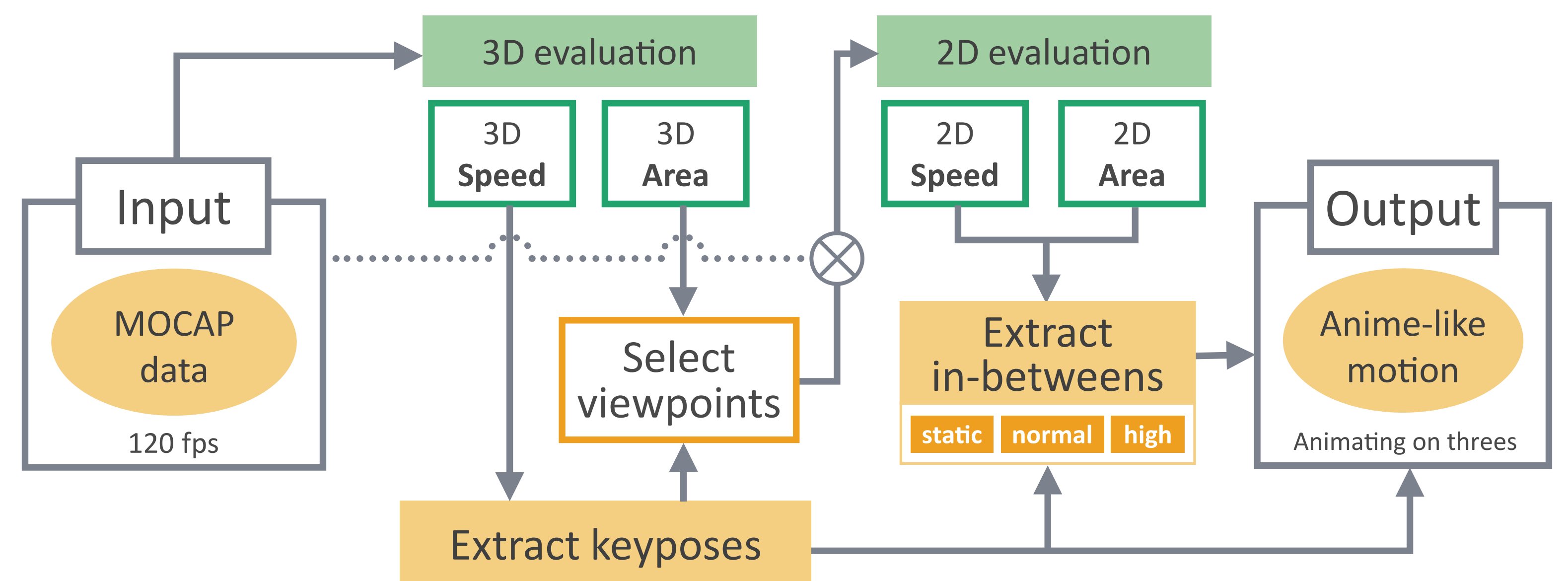
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Method

The poses corresponding to the local minima of the time distribution of speeds are extracted as keyposes. The silhouette of a pose is approximated by a triangle, and a viewpoint giving the largest area when the triangle in 3D space is projected onto the 2D screen is selected as the optimal viewpoint.

In-betweens are extracted for animating on threes according to the speeds between each pair of consecutive keyposes. The poses are selected so the inter-pose distances are eased toward both ends of the keyposes. By omitting the high-speed frames and slowing down the un-omitted part to fill in the omitted frames, the high-speed motion is emphasized as faster than in reality.



Results



Poses were selected to prioritize frames with extremal pose area values and to avoid frames with high speeds.

User can adjust the number of keyposes and the threshold of the speed, and we believe an enhanced interface to specify poses and viewpoints would allow for more highly interactive maneuverability.