

Hackathon 2016: Overlay approach to reconstruct noisy motion data (Satoshi Oota)



Objective: Optical motion capture data contain direct and rich information regarding motor functions. Meanwhile, a drawback of the motion capture analysis is laborious "post process:" i.e., identification (or labeling) of markers by human intervention. Since conventional optical motion capture systems cannot distinguish each marker beyond time frames, the motion track depends on an empirical estimation. This approach feasibly works for human subjects and relatively large animals: virtually automatic motion track is possible for such subjects. However, motion capture on relatively small subjects often face the data missing problem due to marker occlusion as well as intersection of marker trajectories. The data missing is a notoriously serious issue since no proprietary software can appropriately handle it. To overcome this problem, I develop a semiautomatic motion tracking algorithm to fix noisy motion data. We devised "the overlay approach," in which consecutive frames are overlaid to remedy the data missing. Your comments and opinions will be welcomed.

Methods and results: Detailed procedures are described in Mathematica notebook: overlayApproach6b.nb. This notebook requires Mathematica 10, but you may use CDF player distributed by Wolfram Research: <http://www.wolfram.com/cdf-player/> with overlayApproach6b.cdf.

