Accurate coordinations in repeating uchikomi

Judo is often described as an activity which requires a lot of coordination. During a combat, throw duration is less than 0.3s; therefore, it is necessary to automate different actions using uchikomi (repeated entrance or first part of a throw). Software can follow or track a point on a video sequence. This technology can help us to observe, in a micro-analysis, a judo player’s coordination in action. It is be possible to analyze and/or to compare different uchikomi.

Goal

Modeling this part of the judo activity.
Observing precise coordinations of different parts of the body before and after artificial (behavior different from judo) or normal (behavior from judo) disturbances.

Methodology: video sequences with highlighted point on the body

Data collection

Subjects observed:
2 international university level (IUL), 2 national level (NL), 2 proficient level (PL)
At the beginning of the course after 3 minutes running and 2 minutes stretching.

Example 1: software used is Avimeca (manually collects data)
Example 2, 3a, 3b: software used is Kinovea (automatic tracking)

Results

EXAMPLE 1
Uchikomi: Tori (NL) practiced Ouchi-gari as fast as possible, 5 times. Data collection concerns: toe, hips, shoulder, talon

i) On specific uchikomi (i.e. practicing Ouchi-gari), the body of a judo player can be assimilated as a pendulum, on which the fixed point is located on the shoulder level. Coordinations are stable during all the repetitions (i.e. shoulder, talon, hips and toe always did the same movement and their trajectories on graphic crossed themselves at the same time).

EXAMPLE 2
Uchikomi: Tori (PL) practiced Osoto-gari as fast as possible, 10 times
Uchikomi with two blocks: As Tori practices uchikomi, Uke can block (when desired) Tori twice. When Uke blocks, Tori has to apply Harai-goshi and continues again with uchikomi.

Data collection concerns: head

iia) After judo action disturbance, judo player (PL, black belt) recovered his regularity after 3 or 4 repetitions

EXAMPLE 3a
Tori (PL) practiced Osoto-gari as fast as possible 10 times; then tori made 12 rotations on the ground as fast as possible; and then practiced again uchikomi.

iib) After artificial disturbances on balance, judo player (PL, brown belt) didn’t recover his regularity

EXAMPLE 3b
Tori (IUL) practiced Morote-seoi-nage as fast as possible 10 times, then tori made 12 rotations on the ground as fast as possible, and then practiced again uchikomi.

iic) After artificial disturbances on balance, judo player (IUL) recovered his regularity after 3 or 4 repetitions

Perspectives are:

i) Concerning judo: to continue these analyses concerning artificial and judo disturbances and to observe how tiredness during training sessions disturb these coordinations.
ii) Concerning physical adaptations of activities: to carry out some data concerning recovering personal balance.

Calmet M., Miarka B., Franchini E.
1 Université de Montpellier, France, Bolsista CAPES/Brasil 2009
2 Universidade de São Paulo, Escola de Educação Física e Esporte
Grupo de Estudos e Pesquisas em Lutas, Artes Marciais e Modalidades de Combate, Brasil
michel.calmet@gmail.com