Computer Connected Force Platform Performance Assessment and Training Tool for Rock Climbing

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Overview

1. Context
2. Methodology
3. Results
4. Demonstration
5. Conclusion
Special thanks for organising this event

Peter Wolf

Urs Stöcker

Andreas Schweizer

Urs Hefti
Intro:
Context 1: Climbing achievements comparison

Figure: Awesome Image
Context 2: Climbing performance assessment issue
Context 3: Training tools available
Methodology 1: The Tool

Pulled weight

\[ \text{Pulled weight} = \text{Body weight} - \text{Measured weight} \]
Methodology

Steps

1. Ground calibration
2. Users weight calibration
3. Beginning of exercise

Conditions

- Feets remains on the Force Platform
- Absolute weight lifted
- Percentage of weight pulled
- Instant visual feedback

Wii Balance Board error

The max absolute error of the Wii FP is 9.9 N. [Bartlett, 2014]
The Computer application

Absolute weight: 18.26 kg

Relative weight: 75.8%

Objective & Hindsight: 4.52 seconds

Time over margin:
Compatible Force platforms

**Figure**: Wii Balance Board
**EUR 43.24**

**Figure**: Snakebyte Fitnessboard
**EUR 35.79**

**Figure**: Bigben Balance Board
**EUR 31.90**

*source: www.amazon.de*
Suggested uses [Performance assessment tool]

**Athlete Follow-Up**
- Performance following
- Throughout growth
- Weight tracking

**Training outcome**
- Pré-post training

**Climbers classification**
- Maximal finger strengt of athletes

**Sharing and reproducing data**
Comparable data for researches
Suggested uses [Finger specific training]

<table>
<thead>
<tr>
<th>Power</th>
<th>Aerobic endurance</th>
<th>Objective specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>80-90% MS</td>
<td>40 % MS</td>
<td>Route specific effort</td>
</tr>
<tr>
<td>5-10 seconds</td>
<td>15 minutes</td>
<td>Variation of effort</td>
</tr>
<tr>
<td>3-5 minutes rest</td>
<td>Alternating hands</td>
<td>Prehension specific</td>
</tr>
</tbody>
</table>

Table: Suggested Training

**Maximal strength**

Maximal strength (MS) is Maximal pulled weight
Further developments

**Beta Release, November 2014**
Beta release for research, coaches and high level athletes.

**Server data sharing**
Data stored in a server allows coaches to share to each others.

**Smartphone application**
- Smartphones receives program data.
- Audio feedback during exercise.
- Personal athletes training plan.
- Social platform.
Further developments

PATT measured finger strength / Climbing performances

- Franz Kaiser
- Institut für Sportwissenschaft, University of Erlangen-Nuremberg
Thanks

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References

Accuracy of force and center of pressure measures of the Wii Balance Board
Gait & Posture 39, 224 – 228.
Impressions?