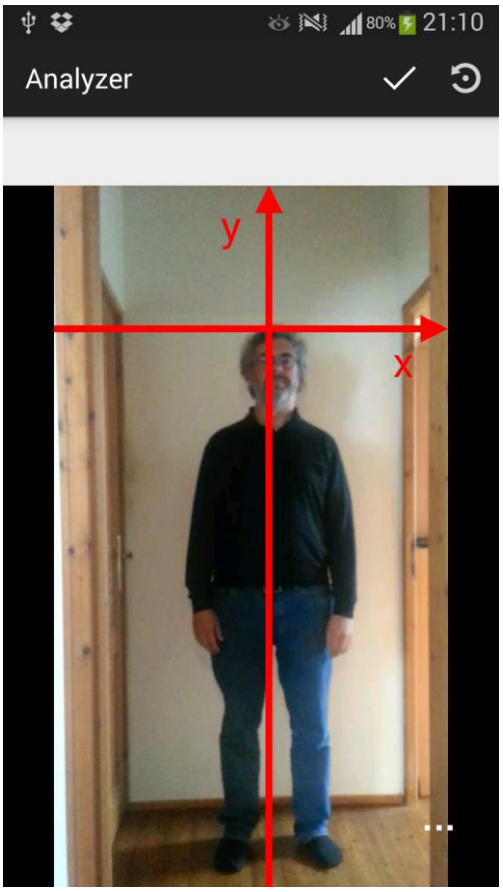
**Analysing a simple jump**

Standing and jumping.

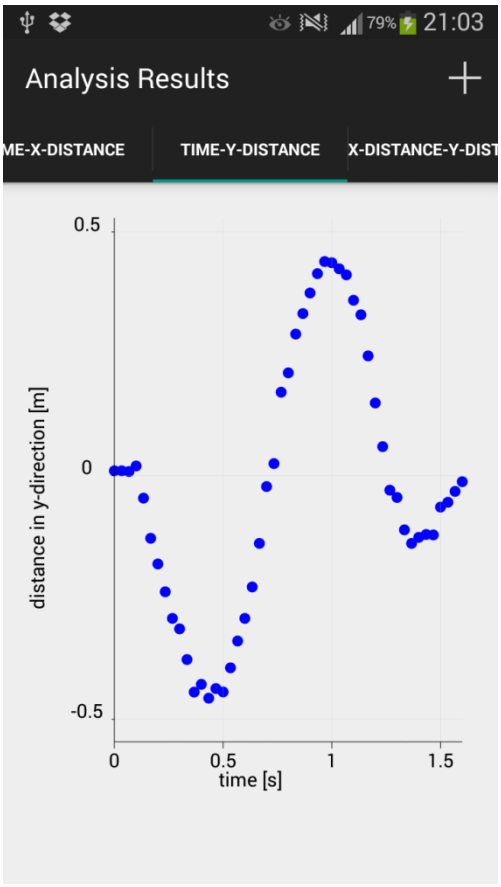
1.85 m body height, about 100 kg weight.

The coordinate system has its zero point at the top of the head.



**time – height diagram**

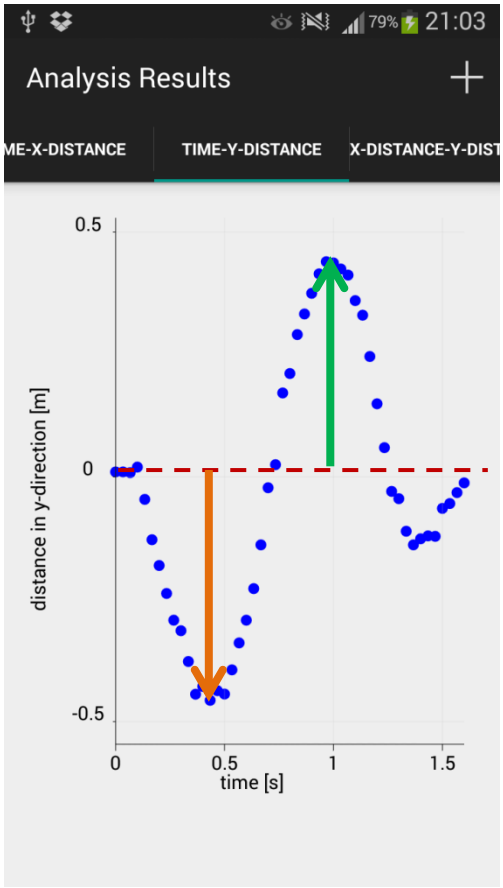
What can we read out?




**Zero line**

1. The body went down about 0.45 m

2. The **height of the jump** (from zero) was about 0,4 m



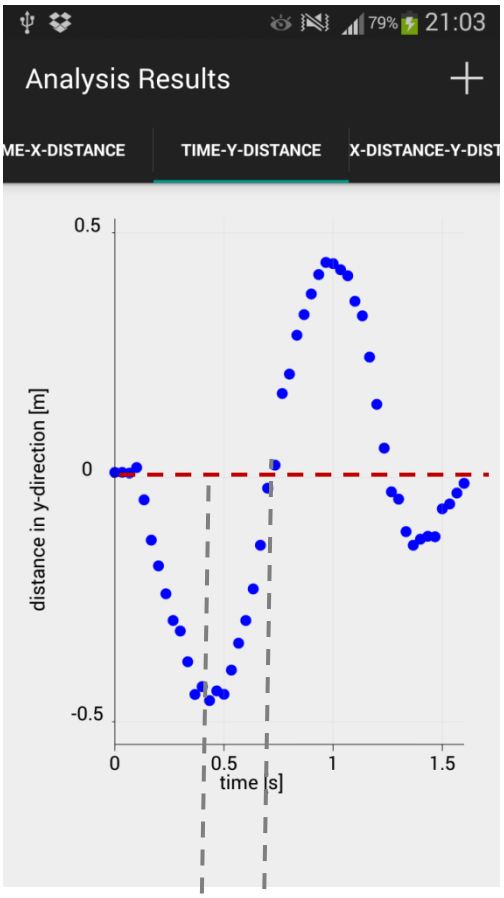
3. The **time of the jump** (acceleration) was about 0.25 sec.

We can estimate the potential Energy:

$E = m \cdot g \cdot h = 100 \cdot 10 \cdot 0.4 = 400$ J

…and the mechanical power:

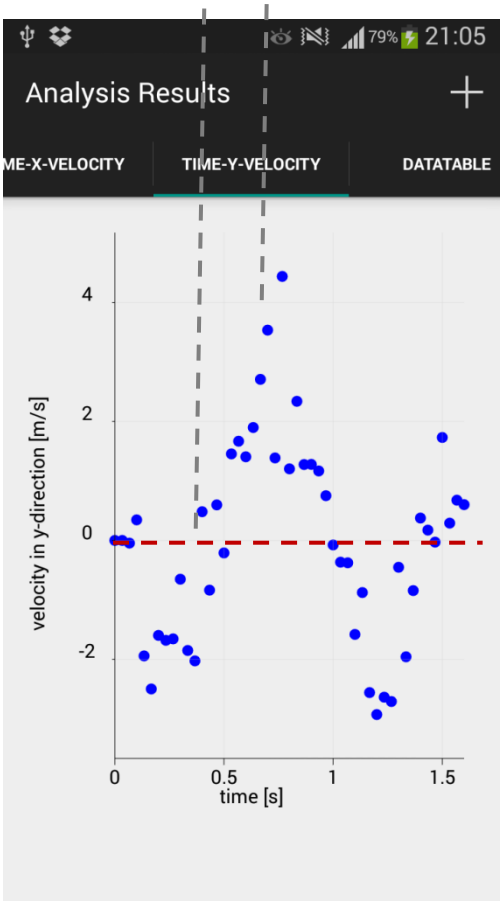
$P = E/t = 400/0{,}25 = 1600$ W




**Time – velocity**

What can we see here?

1. The maximum velocity was about 4,4 m/s
2. This velocity was reached shortly after passing the zero line. Zero velocity we see at the lowest and highest point of the movement.



We approximate the movements by straight lines – this would mean constant acceleration. This can be done within VideoAnalysis.

Going up: The slope is about 8/0.6 = 13,3 m/s²
Falling: The slope is about 6/0.5 = 12 m/s²

The gravitational acceleration should be about 10 m/s². So we can reach an accuracy of about 20 %.

**Discussion:**
We took the whole movement down and not only the free fall.
The differentiation within the app multiplies errors. The acceleration could also be figured out of the t-y diagram (slope of the curve – v, time).
If the length scale is a bit wrong, we get errors in v and a.