

Validation of the Alogo Move Pro system for assessment of jumping performance

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Aim

Quantitative information on the manner in which a horse clears a jump has a great potential to support the rider in improving the horse's jumping performance. The study aimed to validate the Alogo Move Pro sensor system output for **jump height**, **jump length** and **jump take-off angle**, against an optical motion capture (OMC) system.

Material & Methods



Horses and riders

- 11 horse-rider pairs (Fig. 1a)
- 6-10 jumps per rider pair (Fig 1b)
- Upright fences & oxers of 80 cm to 140 cm in height

Measurement setup

- Tent covered arena (Fig. 1c)
- Alogo Move Pro sensor placed in pocket of stud girth (Fig. 1d)
- 24 Qualisys Oqus 7+ cameras covering a 10x20 m measuring volume (Fig. 1c)
- Both systems sampled at 100Hz

Statistics

Residual analysis, Bland Altman plots

Results

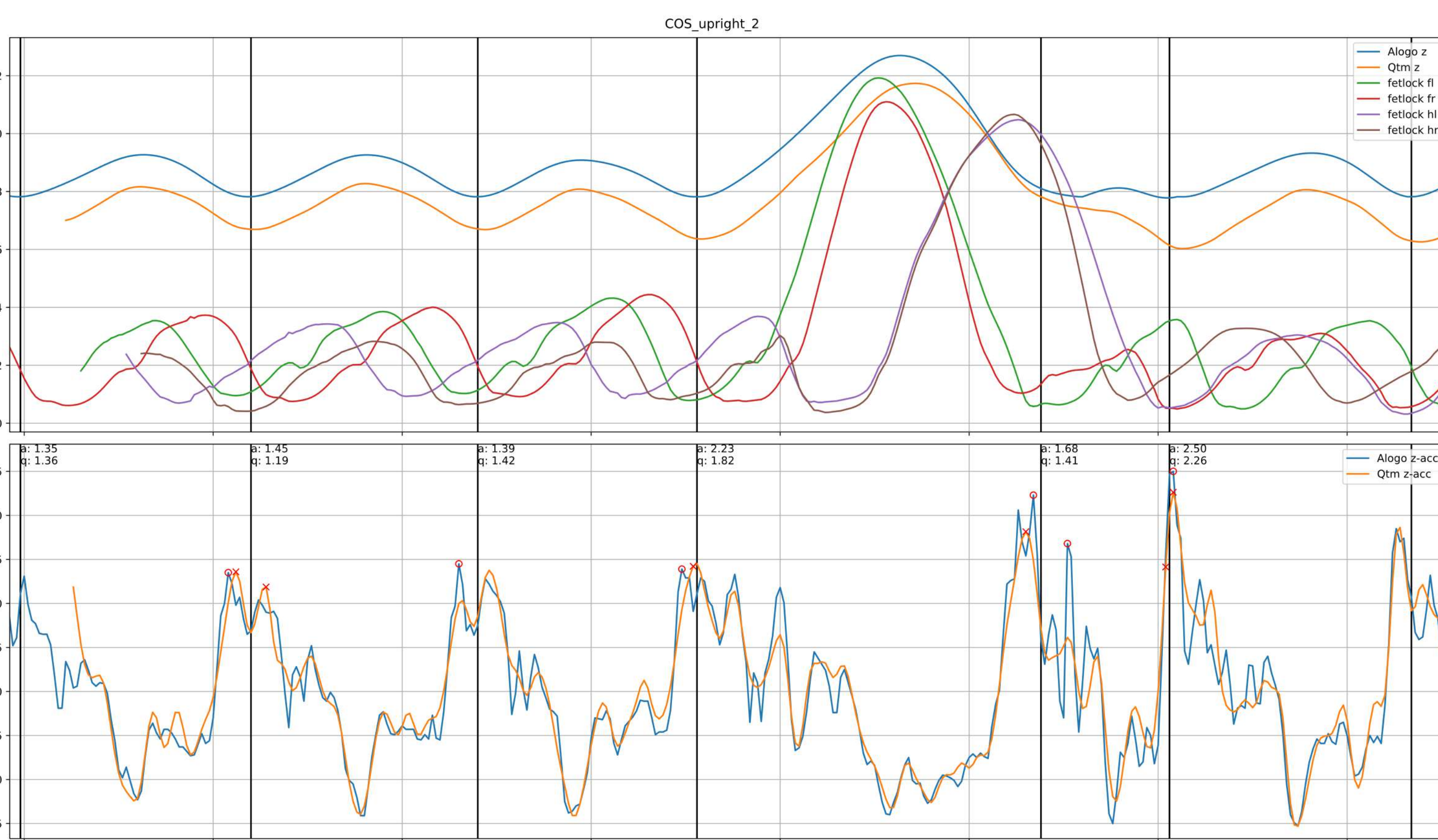


Fig. 2: Time series comparison of vertical position (top; in m) and acceleration (bottom; in G) of Alogo sensor (blue lines) and OMC (orange lines) data during the last three strides leading up to, during and one stride after the jump.

Fetlock position: green line, fl; red line, fr; purple line, hl; brown line, hr.

OMC acceleration appears to match the general shape of the sensor signal. However, specific peak values may differ greatly.

	Jump height	Jump length	Take-off angle
Rho	0.96	0.74	0.84
Bias	8 cm	-47 cm	-0.86°
SD	4 cm	55 cm	2.96°

Tab. 1: Correlation (rho, bias & standard deviation) between Alogo & OMC.

Conclusion

Accuracy and precision of the Alogo system were deemed sufficient under conditions (tent) where GPS signal strength might have been suboptimal. The reason for the differences between certain absolute values, however, requires further investigation.

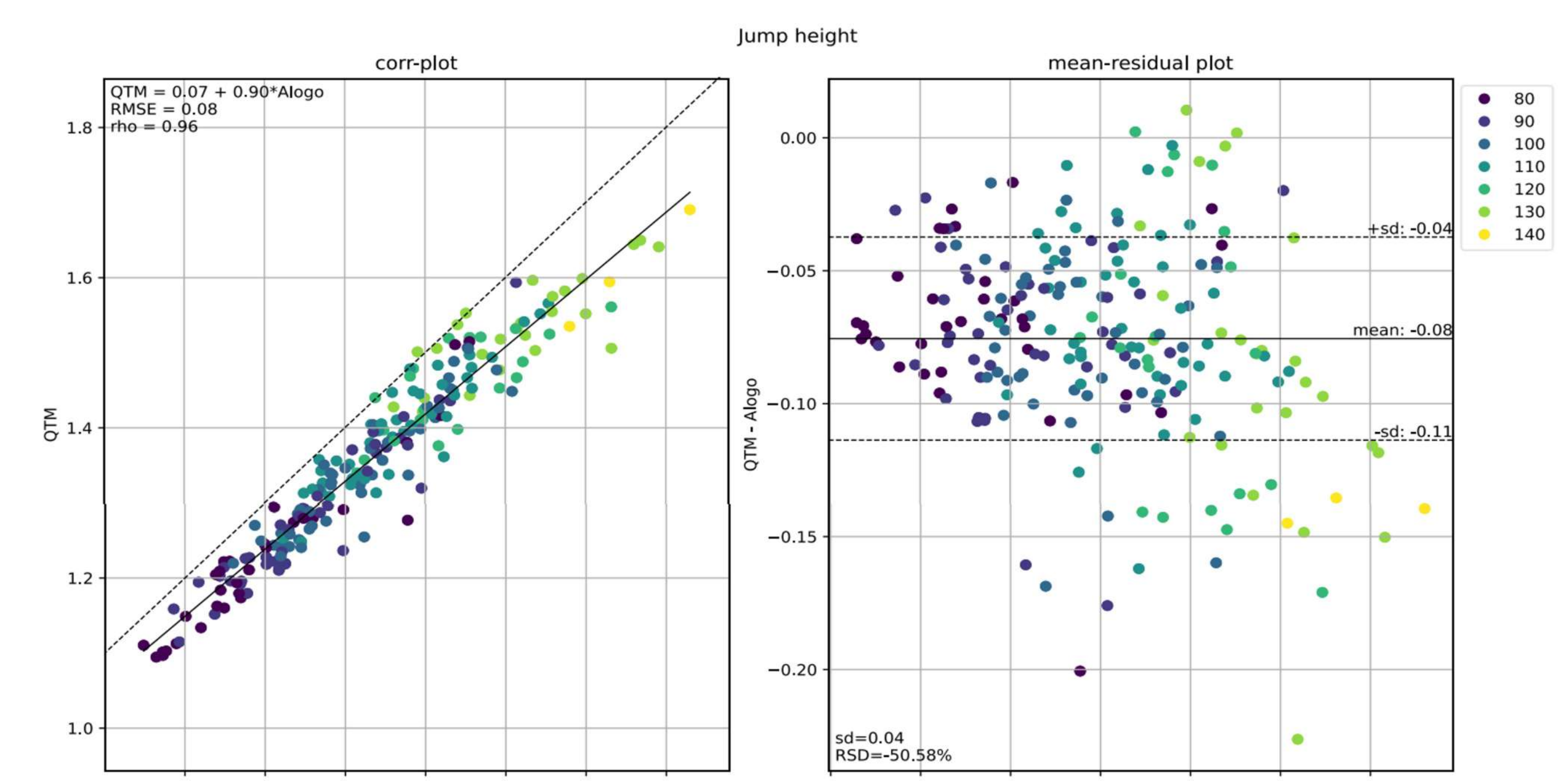


Fig. 3: Comparison Alogo vs. OMC: Bland Altman plot for jump height (m), colored by fence heights (cm).