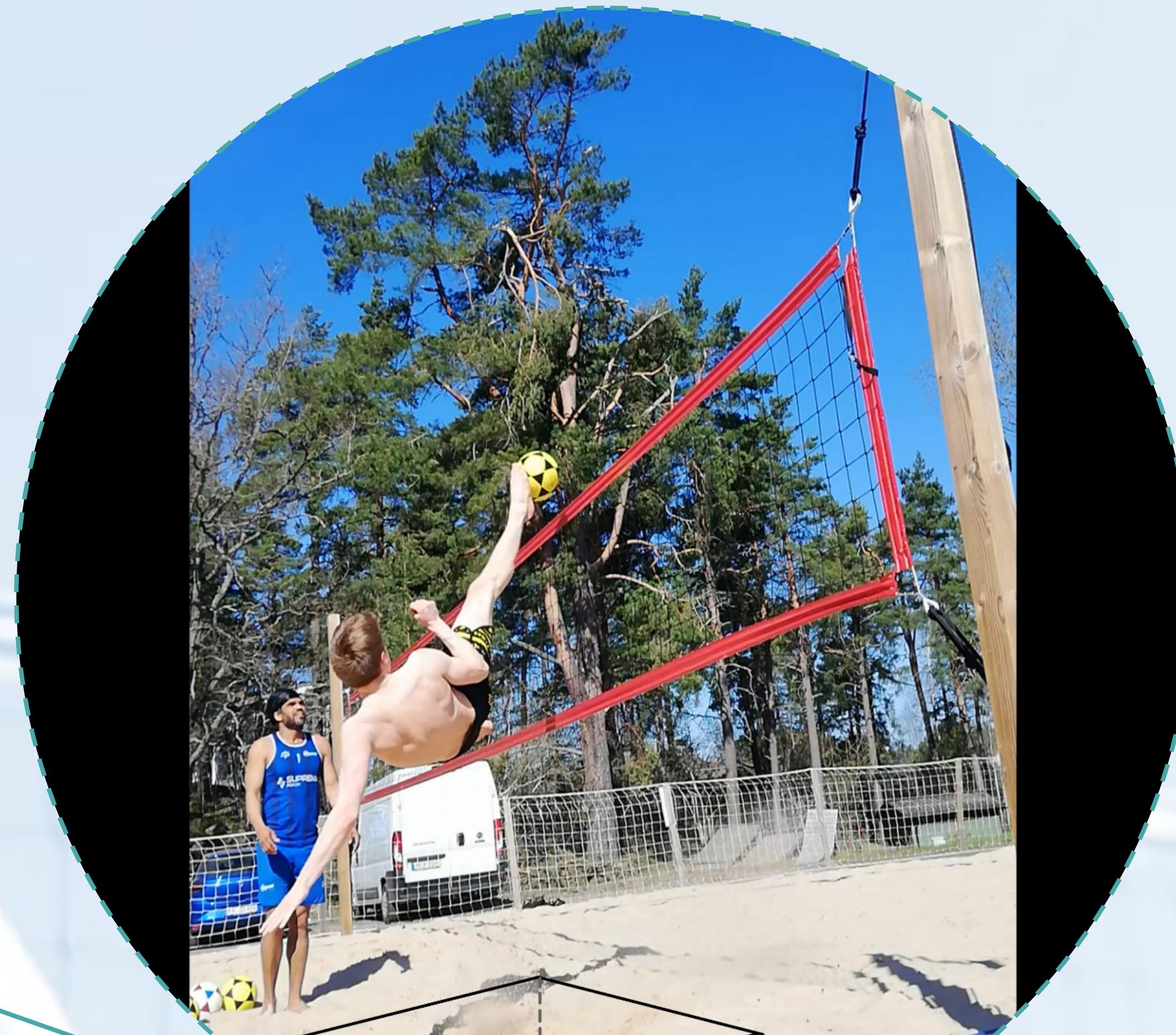


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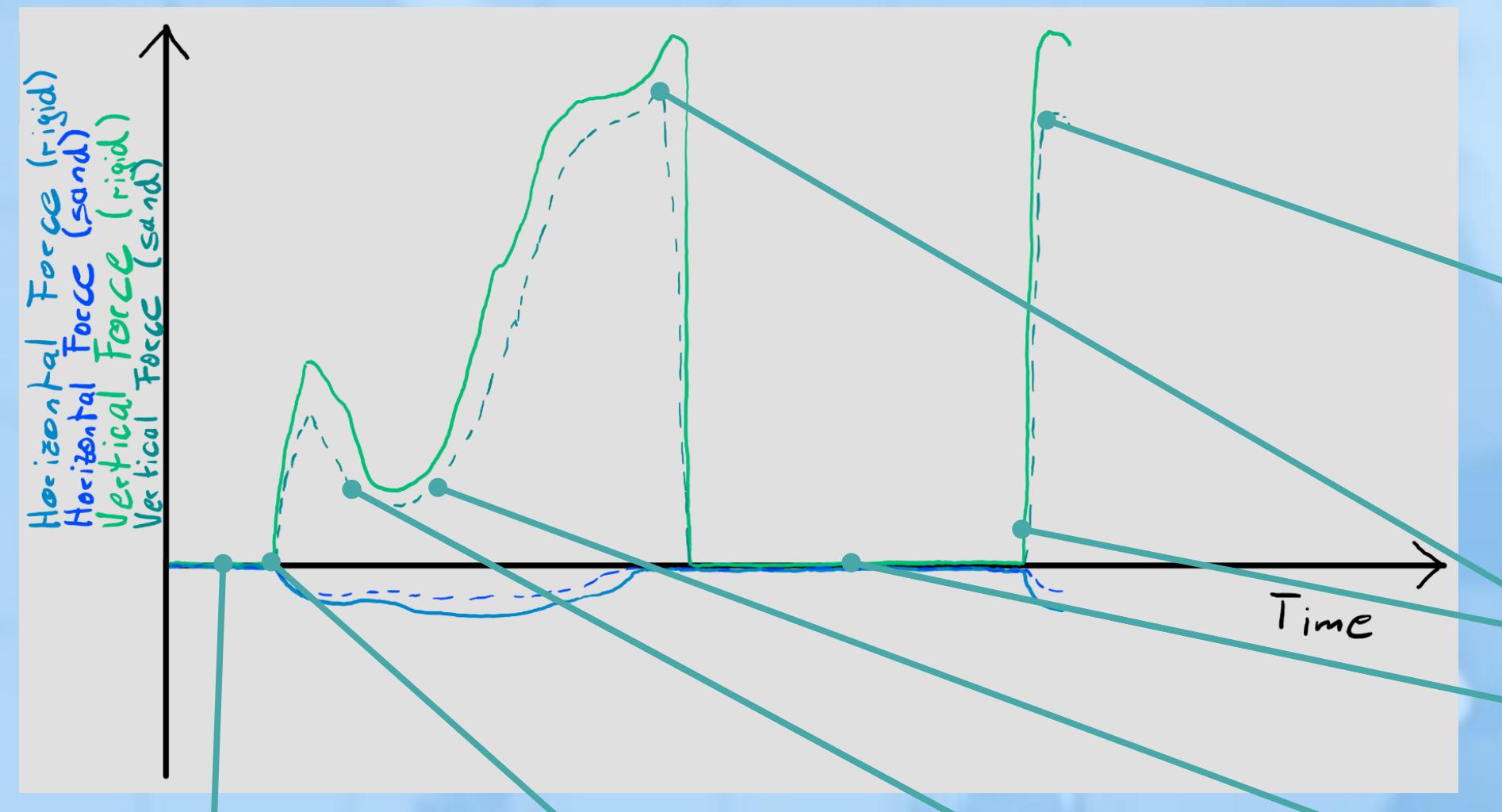
Development of a portable force plate for the analysis of ground reaction force in beach sports

Introduction

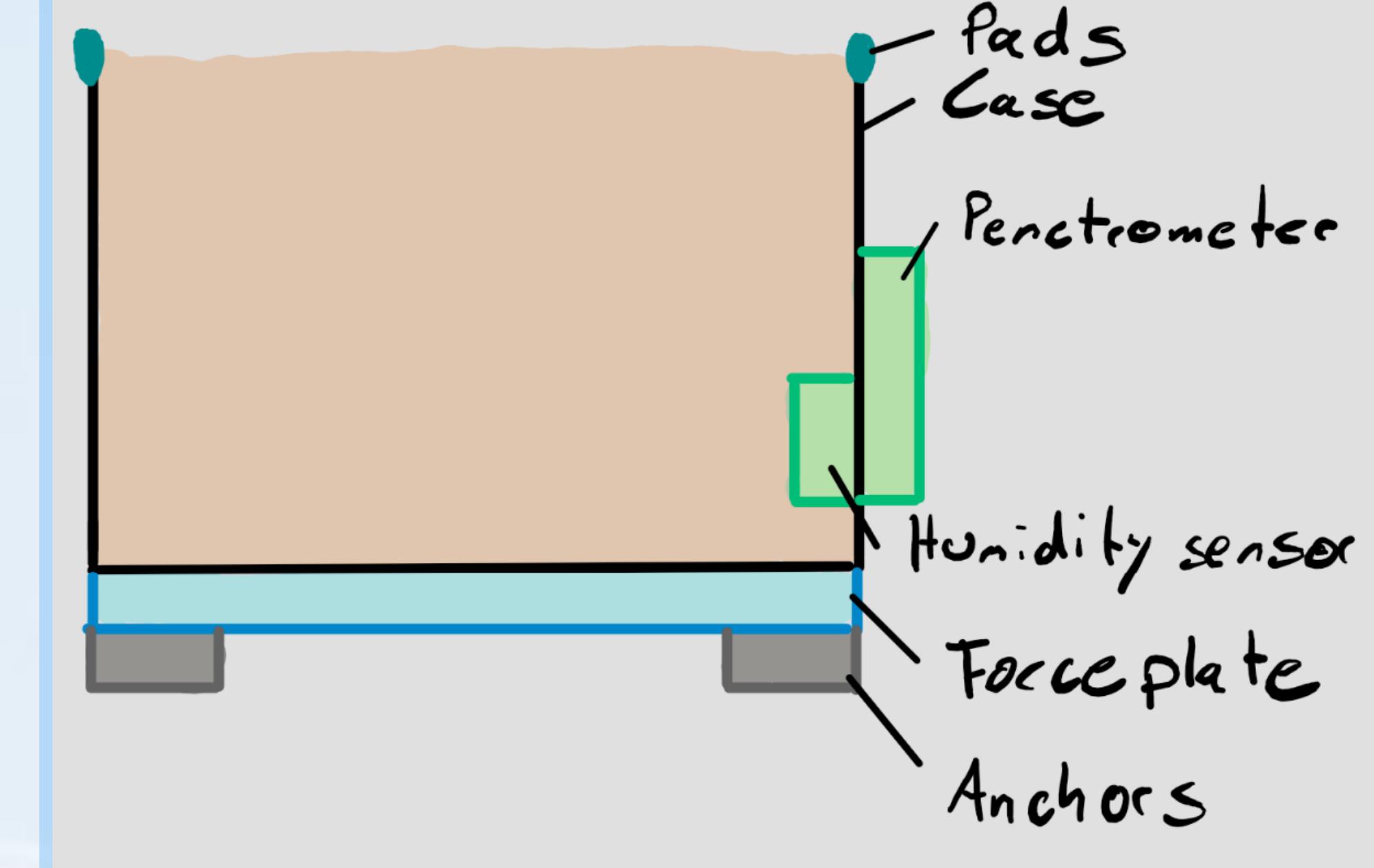
There appears to be a growing popularity for beach sports. In those sports, athletes are faced with different surface conditions [1, 2]. Especially dry uncompacted sand has high absorptive qualities which result in a decrease in the force returned from the muscles [3]. However, optimal force production either vertically or horizontally is essential for competitive success. To predict and measure the performance of an athlete in this quality a vertical jump test is needed [4–7, 2]. Currently, this is tested on solid ground on indoor force plates as this is the ‘gold standard’ for measuring jumping performance [8, 9], but not in the sand.



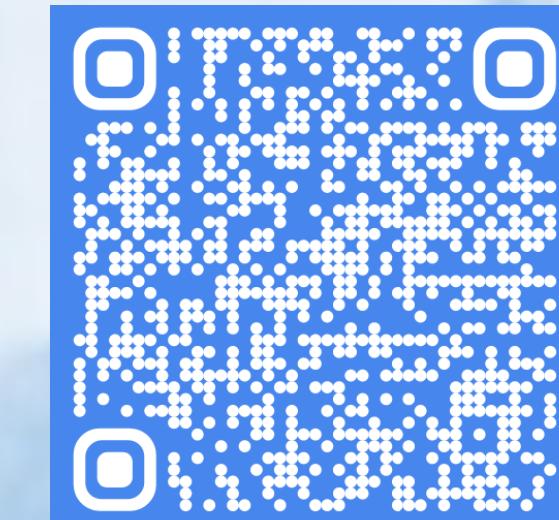
Ground reaction force



Result



Want to know more?



Conclusion

The device is dimensioned by 60 x 60 x 40 cm. It provides a shovel for digging a hole in the court and a stick for stirring the sand inside the box. The apparatus includes a piezoelectric force plate at the bottom of the device, which can be covered with sand, a moisture sensor for measuring the moisture content of the sand and a penetrometer for determining the compaction rate and density. The validity, reliability and comparability of the force curves have to be tested in field situations. Nevertheless, this device can provide more insight into the biomechanics and kinematics of jump performance for athletes, coaches and future research on this topic.

