

Estimating ski orientation using imus in alpine skiing

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- Ski-snow interaction is the fundamental component of alpine skiing. Measuring the orientation of the ski is therefore essential
- We present and validate a method that uses IMUs and the Madgwick-Filter to precisely and accurately estimate peak roll angles

Findings:

- A well-calibrated IMU is a crucial requirement for accurate orientation measurements
- The Madgwick filter is able to compensate inaccuracies even during highly dynamic movements
- The IMU should be mounted to the ski, previous studies mounted the IMU to the rear calf of the ski boot introducing significant errors in accuracy
- With a well defined local to global coordinate frame system, the ski orientation can be determined in a global reference frame