

# Automatic gate-to-gate time recognition from audio recordings in alpine slalom skating using neural networks

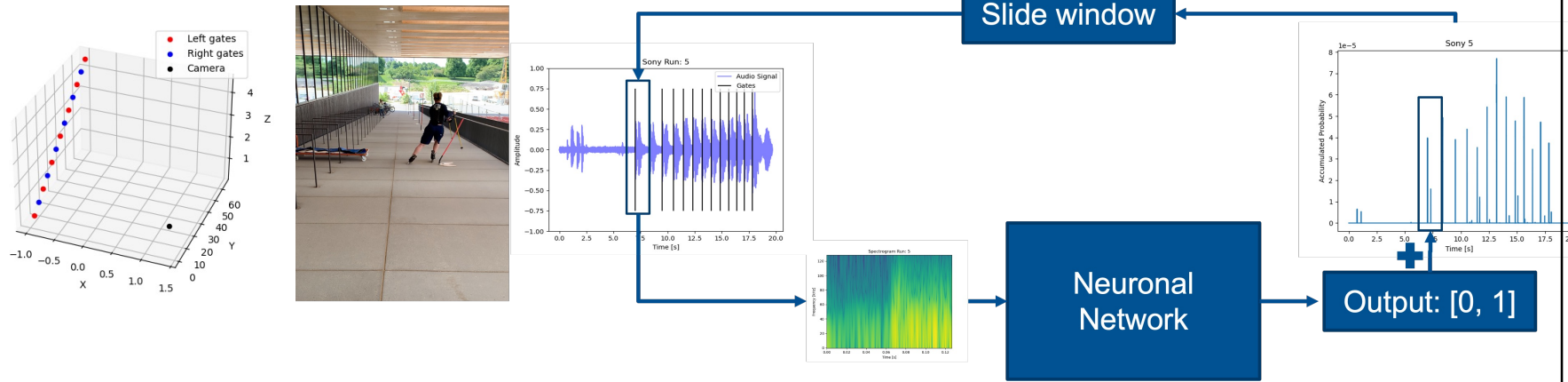
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**Task:** Train neural network on sound of gate contact to automatically compute the gate-to-gate timing based on audio recordings in alpine slalom skating.

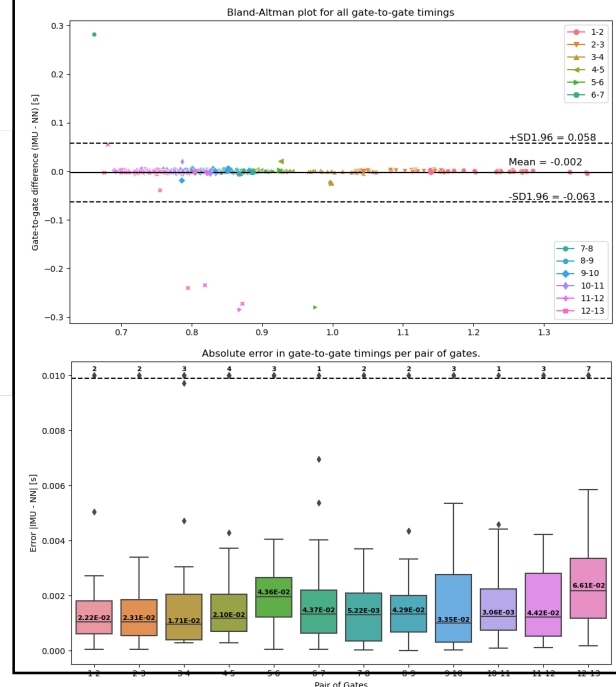
## Methods:

**Data Acquisition:** Slalom run with 13 gates to create training data for neural network. Labelling through IMU measurements and data inspection.

**Neural Network Training:** Sliding window approach with gate or no-gate label for each window. Transformation of audio signal of each window to spectrogram image. Training of neural network on spectrogram with label "gate" or "no-gate" as output. Summation of labels indicate a probability for a gate at a given frame.



**Results:** High correlation and low root-mean-squared error between neural network and IMU data.



**Conclusion:** Neural networks shows promising performance in predicting gate-to-gate timing from audio recordings. Multiple challenges await when moving from skating to skiing.

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