Measuring Violin Sound Radiation for Sound Equalization

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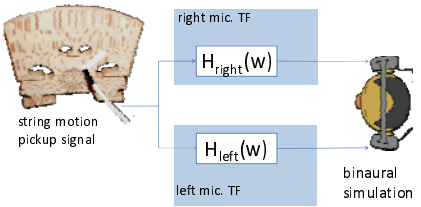
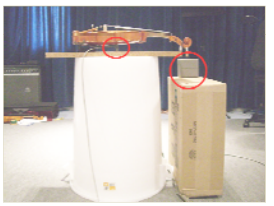
In this work we are measuring and obtaining transfer functions between a bridge pickup mounted on a violin and a microphne, at different angles. The objective is to, given a set of pickup-signal recordings of violin performances, be able to simulate the sound preasure arriving to a listener ears at any position around the player.

I Objective

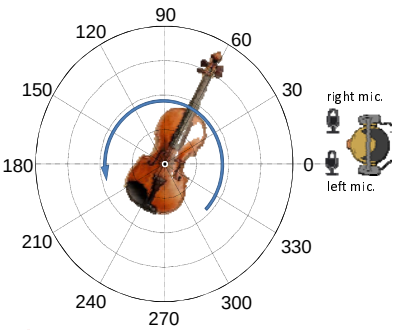


II Measurements

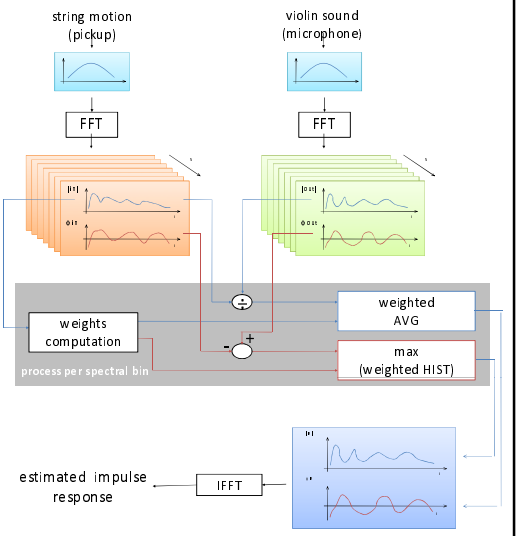
- The violin is mounted on a rotating structure, to take samples at different angles, while keeping the distance to the microhpones.



- Angles are measured with a 3D motion sensor placed under the violin on the rotating axis.
- At each angle, violin is excited by playing a glissando. Pickup and microphone are recorded simustaneously. Acoustic response is captured with two microphones separated a ear-to-ear distance, and two transfer functions obtained.



III TF calculation



IV Radiation patterns

- Typical violin radiation patterns are shown below for different frequencies.