

Problem:

Percussion composing consists of three steps: creating, playing, and notating. In creating, the composer lets their imagination reign, playing gives life to these ideas, and notating turns the creation into sheet music. However, even with dedicated software, notating is *time-consuming*, often leading to *a disconnect between the creative process and the final product*.

Goal:

Design and build a system capable of *accurately detecting* what the user plays and translating the data into *sheet music*.

- Facilitate the evolution from creation to notation.
- Streamline composition.

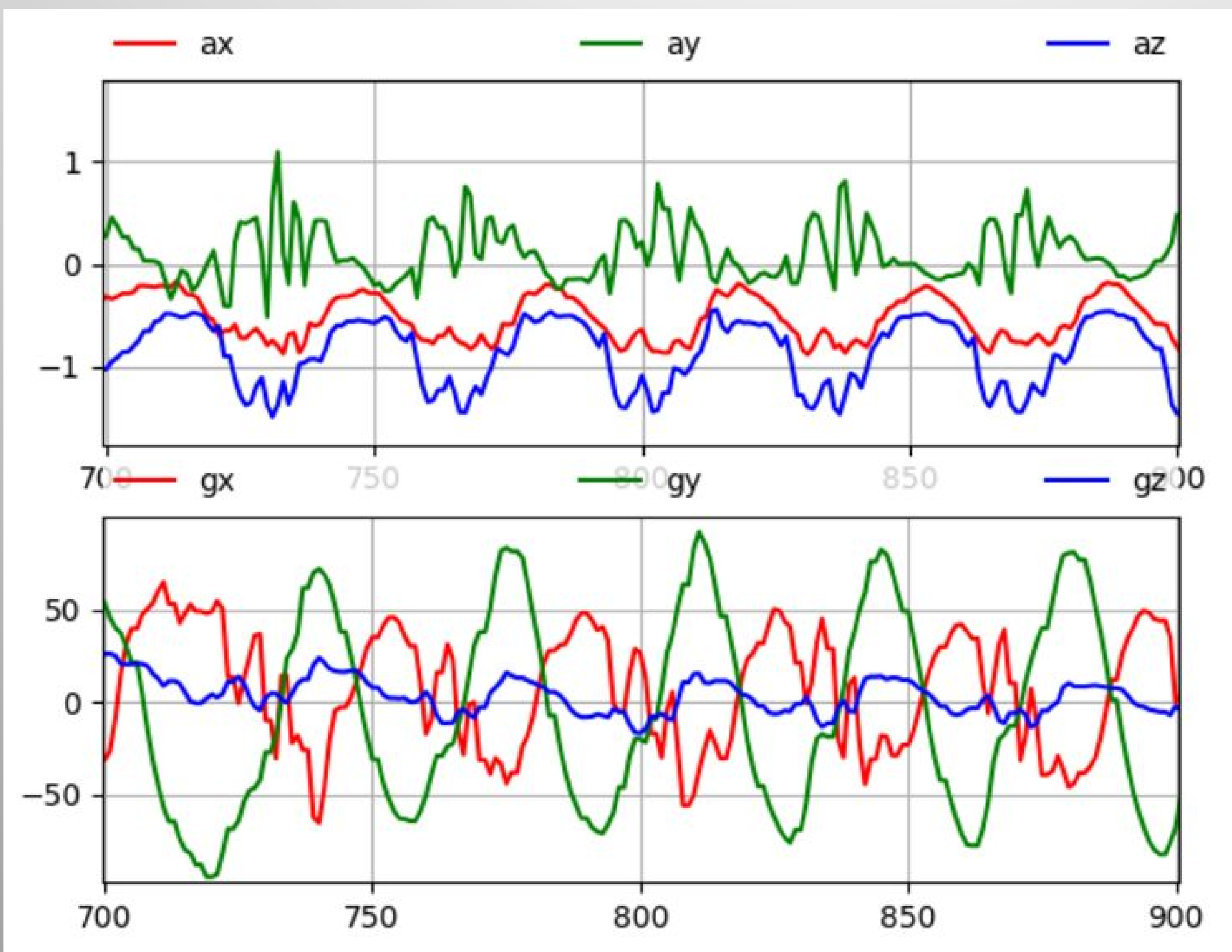
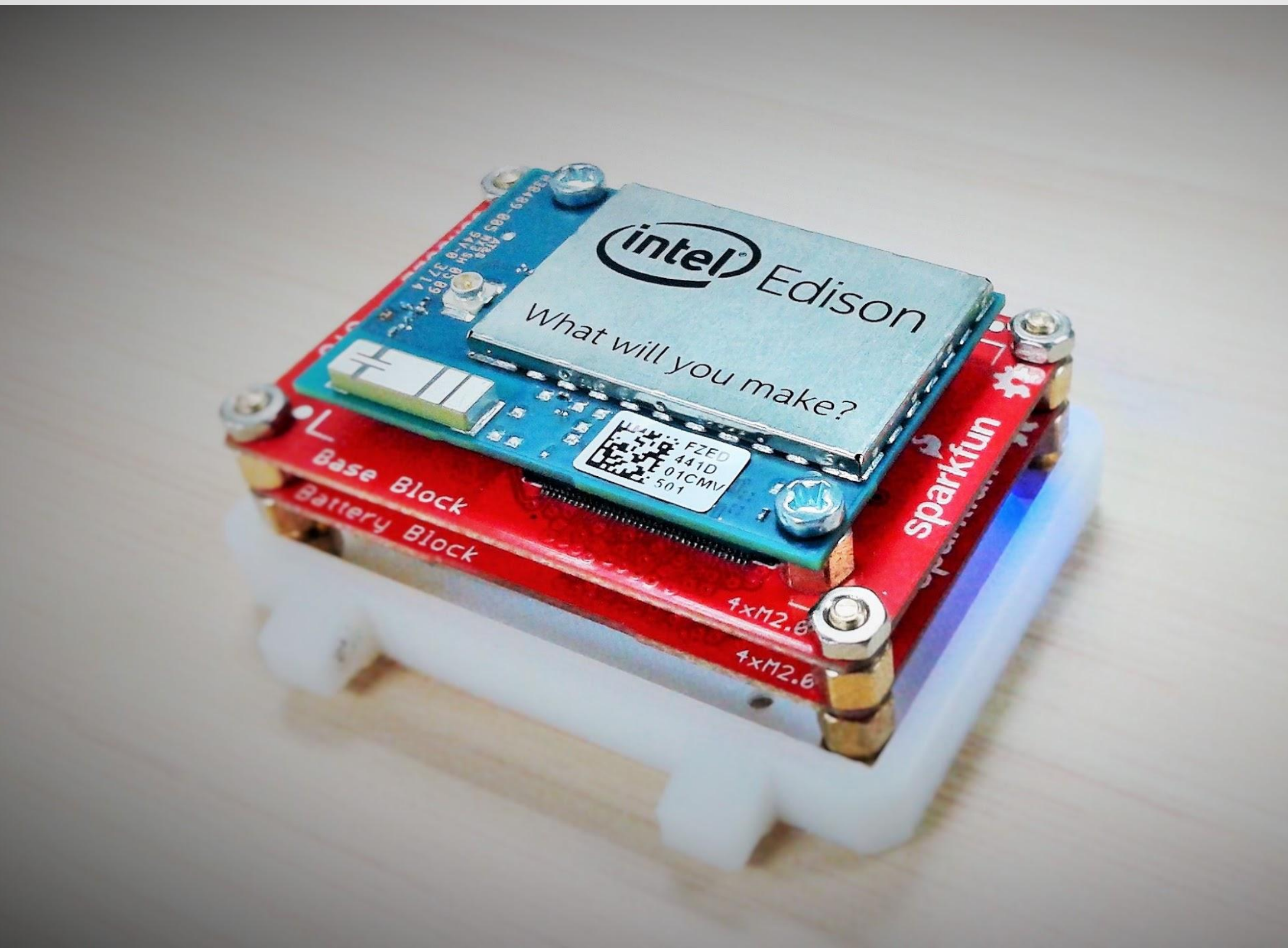
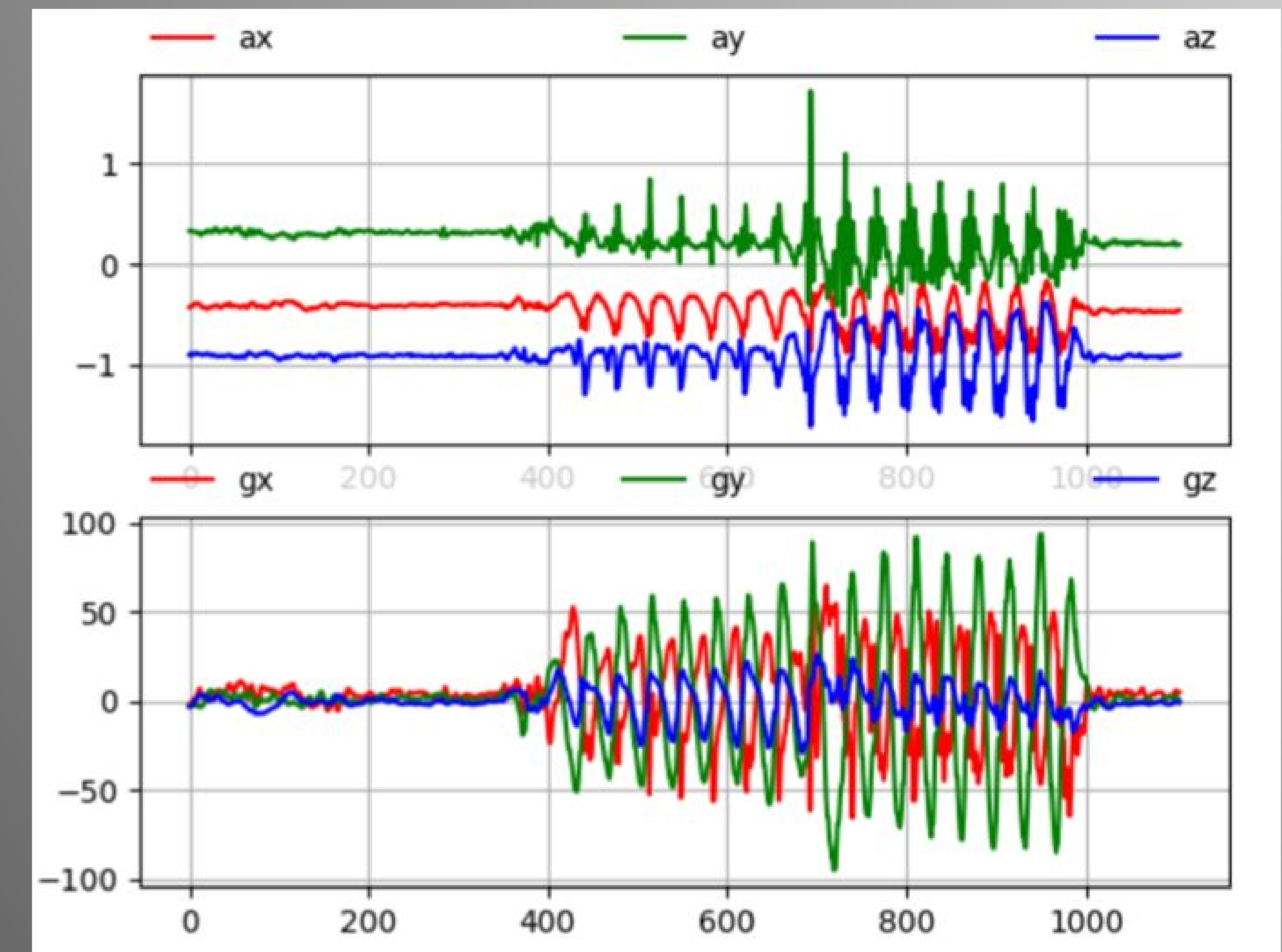
Project Learning:

Notation for snare drums is quite complex. In addition to the right rhythms, we need:

- Volume
- Accents
- Sticking
- Dynamics
- Rudiments
- Rests

Test Data:

Measurements gathered from both accelerometers and gyroscopes. A sample of buzz strokes is seen below:



Solution:

- Two hand-mounted Intel Edisons running data capture code.
- Sparkfun 9DOF Blocks for accel/gyro.
- Bluetooth serial connection to PC.
- A Windows software program for displaying the sheet music played.

Note Calculation:

- Peaks in gyroscopic data indicate hits.
- Time data discretized into 32nd notes.
- Space determines rhythm.
- IMU data determines rudiments.

Note	Spaces	1	2	3	4	5	6	7	8
Quarter	8								
Dotted Eighth	6								
Eighth	4								
Dotted Sixteenth	3								
Sixteenth	2								
Thirty-second	1								

Technology
Utilized:

