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# Simplified NPU

After much consideration, I have decided to implement an NPU (neuromorphic processing unit) for simple gesture recognition from a gyroscope+accelerometer. I would need an MPU-6050 for the gyroscope+accelerometer, which can be found at https://www.adafruit.com/product/3886. I chose to do a gyroscope+accelerometer for my sensor data because it works the best for a simple NPU implementation. The NPU will recognize spikes in data for a particular event based on predetermined weight calculations. Since a simple gyroscope+accelerometer like the MPU-6050 gives serialized data over I2C, it fits well to be able to recognize certain predetermined patterns for a swipe left/right/up/down or turn gesture. I would need to have an I2C bridge like the STM32 or something similar to interface with the MPU-6050, and have some code that will convert the I2C data into a usable 12-bit input format to feed into the ASIC. I would then output the result of the gesture recognition onto LEDs, with swipe left  = 0b0001, swipe right = 0b0010, etc. This design shouldn't need to run more than 10MHz or so.

The actual NPU computation would consist of an FSM-D that waits for data coming in on the inputs, and processes the data using predetermined weight calculation for recognizing a certain gesture based on the pattern of data coming in. This should be doable in about 10 states, along with some arithmetic calculations and registers.