AIML Magic Wands

User Manual

Contents

Summary

Description:

This AIML Magic Wand Demo is based on the samd21 sam-iot board. It is a Gesture recognition demonstrator for the Microchip Machine Learning Development Suite. The Cortex-M0 core in the sam-iot board communicates with an accelerometer and uses 6 Degrees of Freedom which we use as input vectors to determine if a trained gesture has been detected. The LED on the tip of the wand will light up to give the user feedback on their gesture.

Sales Pitch

The Microchip Machine Learning Development Suite delivers highly efficient algorithms that can run on small MCU's to give more intelligence on edge devices. This demo demonstrates a interesting gesture use-case that can run on a normal ARM cortex-M0+ device with no Vector acceleration and still perform well! By the time a user is finished with this demo they should have confidence that they can also implement an accelerometer-based machine learning gesture algorithm on small MCU's with no Neural Acceleration. All of the tools needed can be accessed from within the MPLAB® development tools. Whether you're creating a smart gesture device or other time-series data edge AI applications, Microchip can support their ideas.

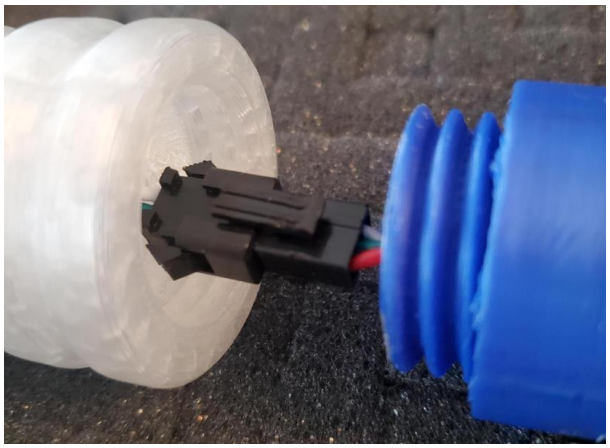
Packaging & Set Up & Tear Down

Pack List:

- Wedge (all below attached to wedge)
  - **GOLD** Wand Handle (Inference Wand)
  - **BLUE** Wand Handle (Data Logging Wand)
  - 2x Wand Toppers
  - 3x Micro-USB to USB cables
  - SAM-IOT board (Wi-Fi Server)

Set Up:

1. Remove Wand Handles from Pelican case.
2. Plug Wand toppers into 3-pin connectors of the Wand Handle then screw them together.



3. Plug in USB cable into wands to charge wands (For **BLUE** wand, the cable is also used to send data to the Data Visualizer)
4. Plug USB cable into Sam-iot server board and connect to MPLAB PC (If using Wi-Fi)

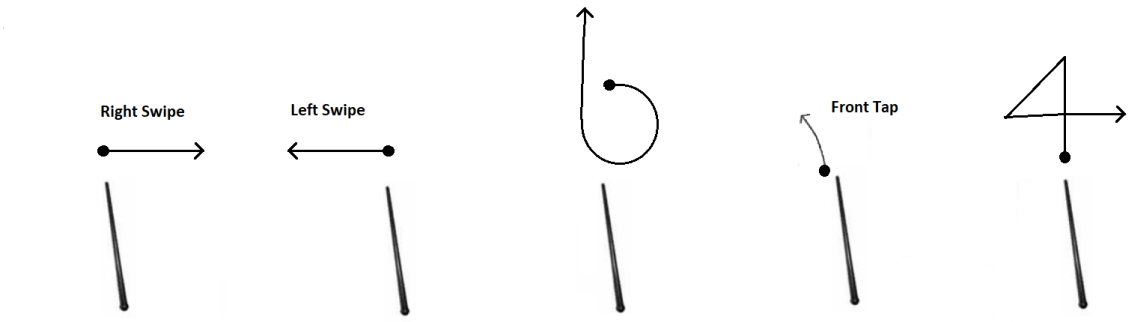
Tear Down:

1. Unplug all devices and put USB cables back into case
2. Unscrew wand toppers from handles, unplug and pack Toppers
3. Put Sam-iot server board back in ESD bag and pack

Using the Demo

After demo set up, turn on GOLD wand (inference wand)

1. Hold the **GOLD** wand, press button while performing wand gestures:



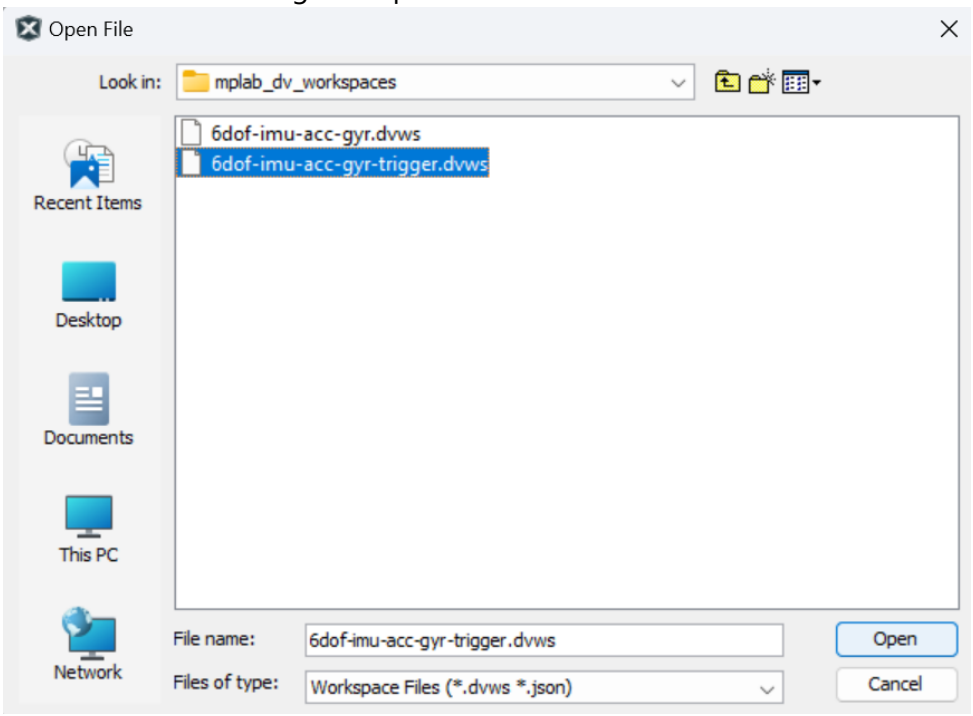
2. Notice color of tip LED to see how well you did.

- idle
- right
- left
- b
- tap
- Unknown
- 4

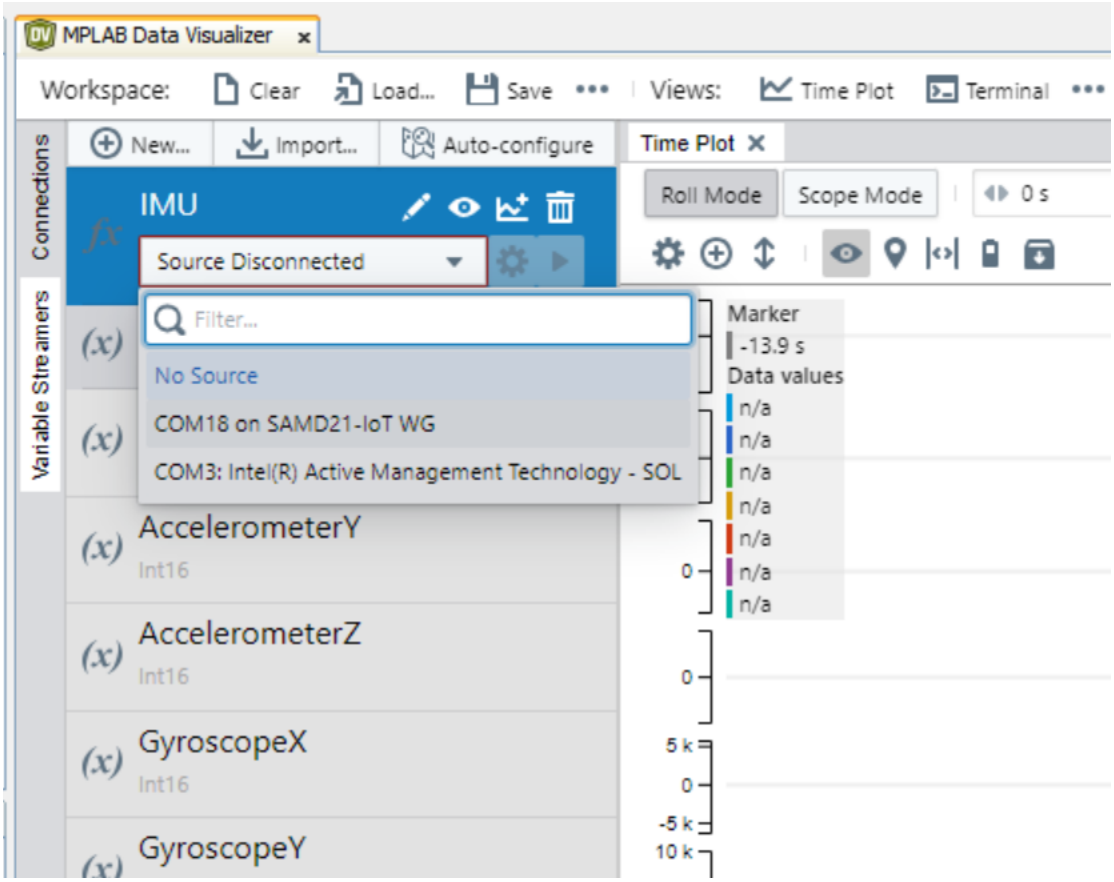
For Data Logging, connect USB cable and turn on BLUE wand (Data Logging Wand)

1. Open MPLAB Data Visualizer and Press Load workspace:

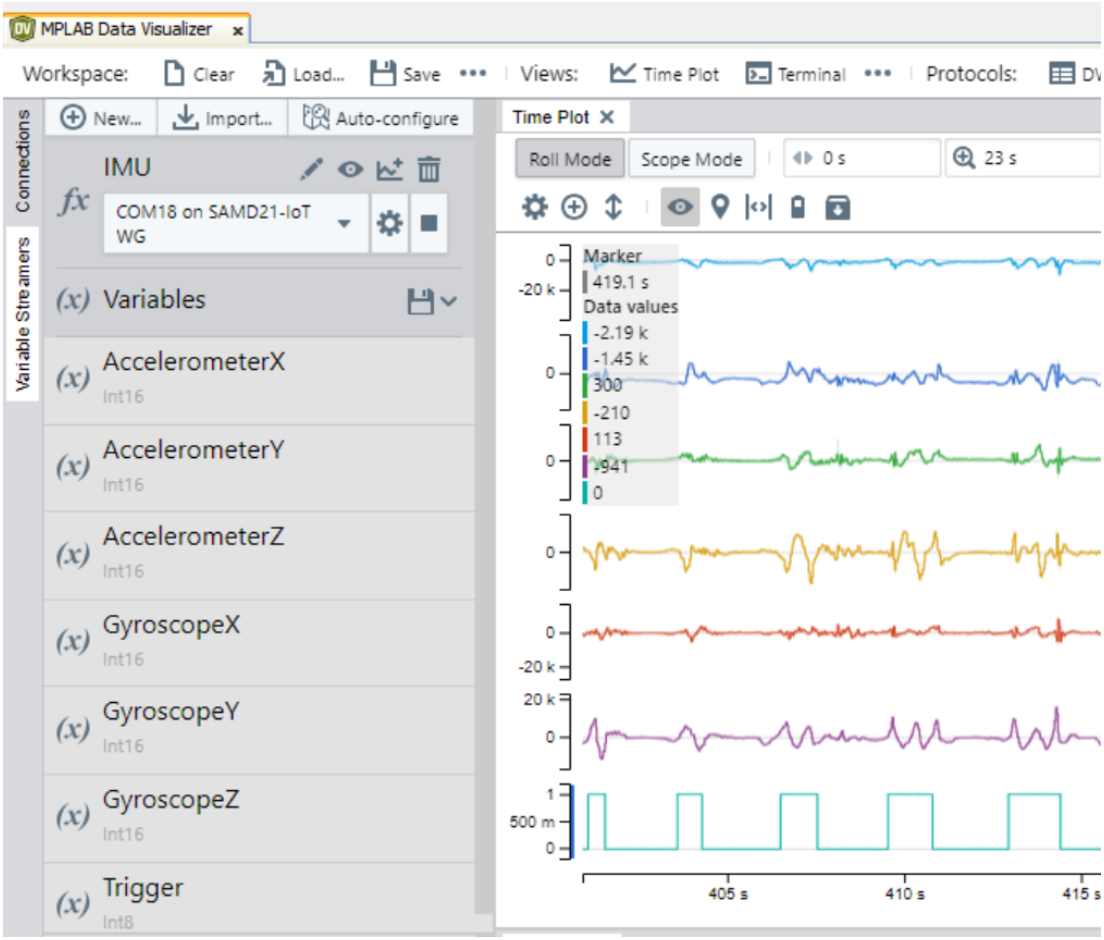
2. Browse to the following workspace:



3. Open COM port associated with the **BLUE** wand



4. Log gestures by pressing button while carrying out gestures



Demo System & Shipping

Find more information and files in the demo system:

https://github.com/k-mchp/d21-wand