Gating_association_demo

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This document explains the key functions in the scripts of this demo.

For instructions, refer to the README instead.

About

This demo shows a gating and association plot and a live video feed on a GUI run on MATLAB.

The GUI consists of two pages:

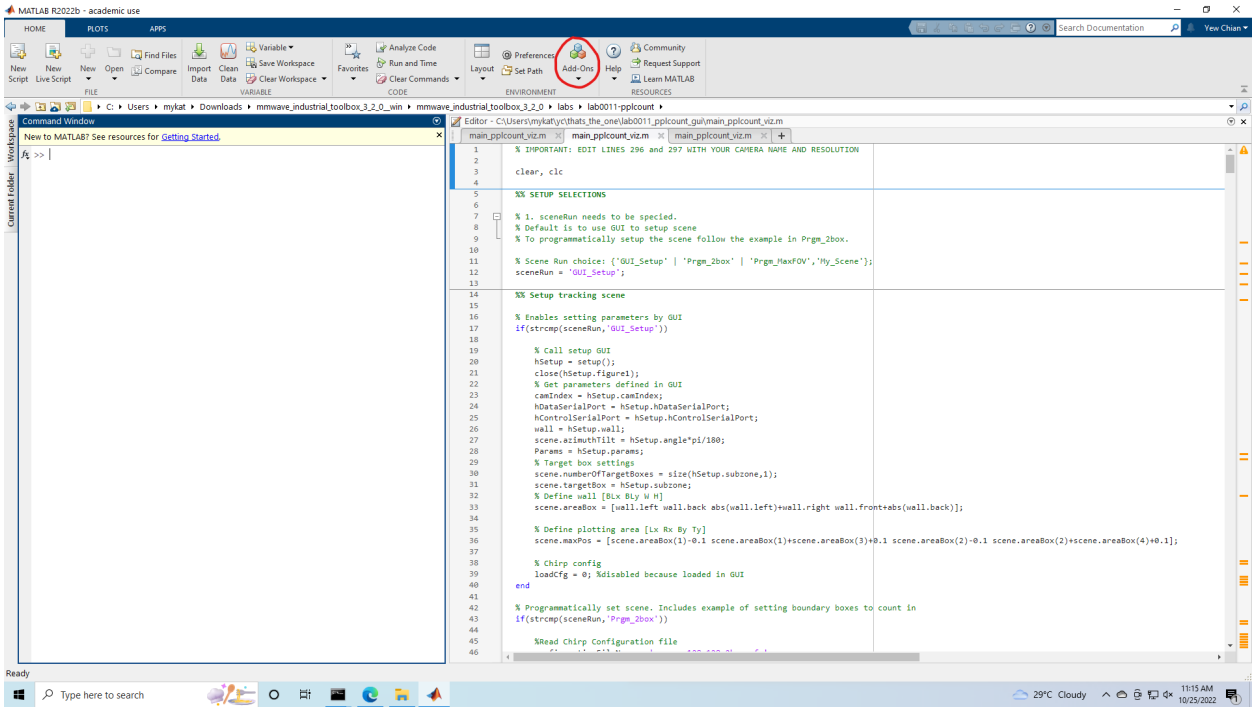
1. Setup page
    a. This page allows you to connect your ports and adjust the axes of the plot
2. Plot page
    a. This page shows the gating and association plot and a video feed

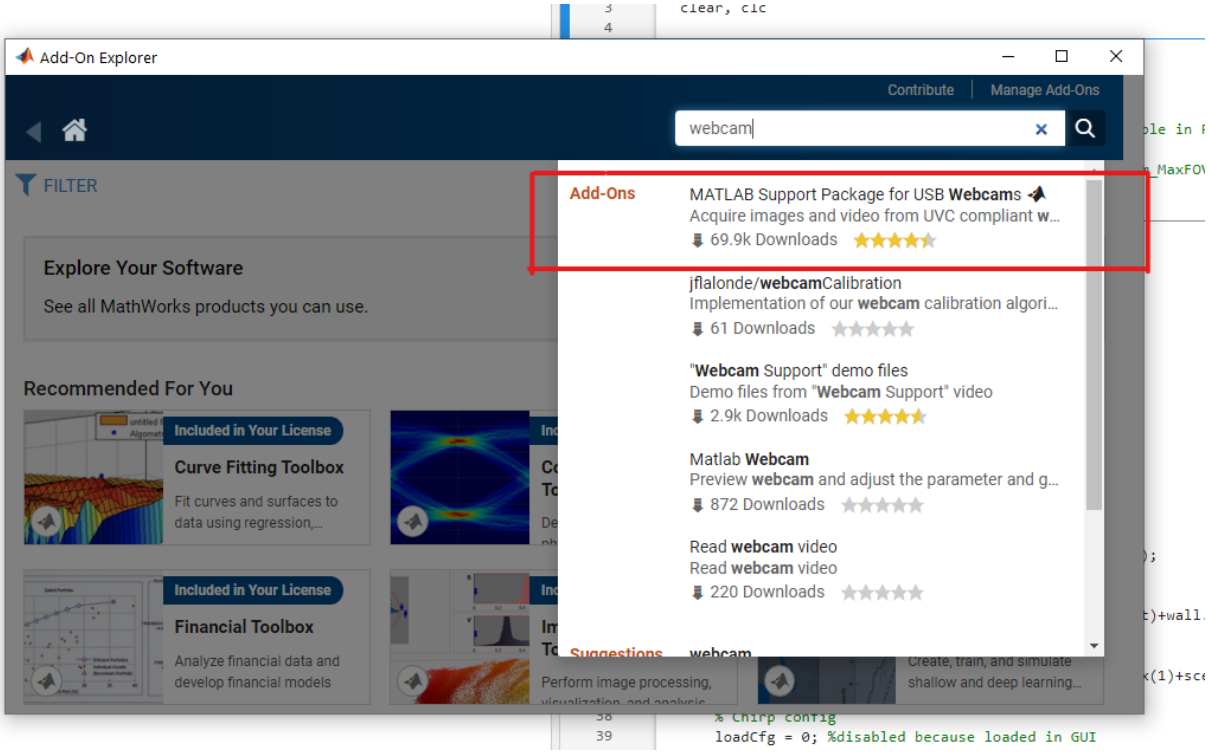
Installing the webcam add-on

To run this demo, the MATLAB Support for USB Webcams add-on must be installed.
Instructions:

1. Click on the Add Ons button under the Home tab in MATLAB

2. Search for MATLAB Support for USB Webcams and install it





Folder Structure

The important files in the folder are:

1. main_pplcount_viz.m
    a. Produces most of the Plot page
2. mmw_pplcount_demo_default.cfg
    a. Config file to be read by radar
3. setup.fig
    a. MATLAB file that allows easy editing and positioning of GUI elements
4. setup.m
    a. Produces most of the Setup page

In this document, we will explain the code in main_pplcount_viz.m

Functions in main_pplcount_viz.m

Lines 193+

```
193  %% Setup figure
   1
   2  figHandle = figure('Name', 'Visualizer','tag','mainFigure');
   3
   4
   5  clf(figHandle);
   6  set(figHandle, 'WindowStyle','normal');
   7  set(figHandle,'Name','Texas Instruments - People Counting','NumberTitle','off')
   8
   9  set(figHandle,'currentchar',' ')         % set a dummy character
  10
  11  warning off MATLAB:HandleGraphics:ObsoletedProperty:JavaFrame
  12  jframe=get(figHandle,'javaframe');
  13  set(figHandle, 'MenuBar', 'none');
  14  set(figHandle, 'Color', [0 0 0]);
  15  pause(0.00001);
  16  set(jframe,'Maximized',1);
  17  pause(0.00001);
```

These lines are the start of defining the GUI variables on the Plot page.

Lines 216+

```
216  figureTitles = {'Statistics', 'Gating and Association', 'Point Cloud', 'Video', 'Chirp Configuration'};
   1  figureGroup = [1, 3, 2, 4, 1, ];
   2  numFigures = size(figureTitles, 2);
   3  hFigure = zeros(1,numFigures);
   4
   5  hTabGroup(1) = uitabgroup(figHandle, 'Position', [0.0 0 0.2 1]);
   6
   7  hTabGroup(3) = uitabgroup(figHandle, 'Position', [0.2 0.5 0.8 0.5], 'Visible', 'on');
   8  hTabGroup(2) = uitabgroup(figHandle, 'Position', [0.2 0.0 0.8 0.5], 'Visible', 'off');
   9  hTabGroup(4) = uitabgroup(figHandle, 'Position', [0.2 0.0 0.8 0.5]);
```

These lines position the tabs on the GUI.

Lines 231+

```
231  % Creating elements in the second section of the GUI
   1  for iFig = 1:5
```

This for loop runs the logic for the tabs and plots open, especially the gating and association plot and the video feed.

Lines 421+

```
%% Main
while(isvalid(hDataSerialPort))


    while(lostSync == 0 && isvalid(hDataSerialPort))

        frameStart = tic;
        fHist(frameNum).timestamp = frameStart;
        bytesAvailable = get(hDataSerialPort,'BytesAvailable');
        if(bytesAvailable > maxBytesAvailable)
            maxBytesAvailable = bytesAvailable;
        end
        fHist(frameNum).bytesAvailable = bytesAvailable;
```

These lines and many more after are responsible for parsing radar data.

Important: These lines need to be edited to define the webcam used

```
            %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
            % EDIT THESE LINES
            cam = webcam("Intel(R) RealSense(TM) Depth Camera 435i RGB");
            cam.Resolution = '1280x720';
            %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

Note about setup.m

The functions here are called when the buttons in the GUI are called.
More importantly, lines 193 and 194 must be edited with the correct ports.

```

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% EDIT THESE LINES
controlSerialPort = 'COM7';
dataSerialPort = 'COM8';
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

```

controlSerialPort: UART

dataSerialPort: DATA