

Matlab Tips and Tricks

Displaying Video

Displaying a video feed in Matlab can be slow if only using the basic properties of figures.

An easy to setup but poor performance video display can be made by simply giving focus to a figure every frame and calling `imshow(image)`.

```
fig01 = figure(1);
while 1
    figure(fig01);
    imshow(newFrame);
end
```

Performance can be greatly increased at the expense of code complexity. The reason the first method is slow is because every time `imshow` is called, the previous image is destroyed in memory along with all the parameter used to create the figure, and then it's all built back up from scratch.

The code below shows how to update the image data in the the figure without reconstructing the figure.

```
img = zeros(512, 512, 3); %512x512 rgb image placeholder
fig01 = figure(1);
imgHandle = imshow(img);
```

```
MainLoop = 1;
```

```
while MainLoop
    img = RoboRealm('get_image');
    set(imgHandle , 'CData',img);
    drawnow;
end
```

Using this method requires that all object be created upfront before the main loop, and the 'set' function access the properties of an object through the handle.

We can extend the figure to display the frames per second by using the 'text' function overlaid on the video feed.

```
img = zeros(512, 512, 3); %512x512 rgb image placeholder
fig01 = figure(1);
imgHandle = imshow(img);
hold on
textHandle = text(8,15,['fps:', num2str(0)],'BackgroundColor',[.7 .9 .7]);
hold off

MainLoop = 1;

while MainLoop
    timer1 = tic;
    img = RoboRealm('get_image');
    set(imgHandle , 'CData',img);
    set(textHandle,'String',['fps:', num2str(1/toc(timer1))]);
    drawnow;
end
```

This can be extended even further to allow the drawing of plots over our video.

```
img = zeros(512, 512, 3); %512x512 rgb image placeholder
fig01 = figure(1);
imgHandle = imshow(img);
hold on
textHandle = text(8,15,['fps:', num2str(0)],'BackgroundColor',[.7 .9 .7]);
plotHandle = plot(x1,y1, 'r+');
hold off

MainLoop = 1;

while MainLoop
    timer1 = tic;
    img = RoboRealm('get_image');
    set(imgHandle , 'CData',img);

    set(plotHandle , 'XData', newX1);
    set(plotHandle , 'YData', newY1);
    set(plotHandle , 'Color', 'g');
    set(plotHandle , 'LineWidth', 2);

    set(textHandle,'String',['fps:', num2str(1/toc(timer1))]);

    drawnow;
end
```

Object handles can be placed in an array.

```
plotHandleArray = [plot(0,0, 'r'), plot(0,0, 'g'), plot(0,0, 'b'), plot(0,0, 'y)];
```

And accessed in the same manner as any other Matlab Array

```
set(plotHandleArray(1) , 'XData', newX1);  
set(plotHandleArray(1) , 'YData', newY1);
```

These should be a decent starting reference for real time display of any video feed.