Systems Neuroscience
Matlab, 3+ dimensional data

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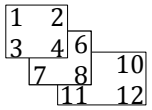
JMH 332

Matrices in *n* dimensions

```
x=[1 2 3; 4 5 6]
```

$$\begin{bmatrix}1 & 2 & 3\\ 4 & 5 & 6\end{bmatrix}$$

```
y(:,:,1)=[1 2; 3 4]
y(:,:,2)=[5 6; 7 8]
y(:,:,3)=[9 10; 11 12]
size(y) ->[2 2 3]
```



Typical brain data : location of neuron (x,y,z) + time

Heat-maps

imagesc(Data) – view 2D matrix of scaled data as image
• Red is highest value, blue is lowest value

Visualize a 2D slice of brain data (size(brainData) -> 128x128x88)

```
slice=squeeze(brainData(:,:,20))
```
-> slice 20 of brain

```
imagesc(slice)
```

Scaling vs. not-scaling

`imagesc(Data)` – view 2D matrix of scaled data as image
• Red (or yellow) is highest value, blue is lowest value

`image(Data)` – view 2D matrix of data as image
• Red (or yellow) is 64 or higher, blue is 0 or lower

```
slice=squeeze(brainData(:,:,10));
figure; imagesc(slice);
```
vs
```
figure; image(slice)
```

Multiple plots

figure -> opens new plotting window

subplot(r,c,i) -> creates grid of plots with

- r rows
- c columns
- fill in position I

```
A=squeeze(brainData(:,:,10));
subplot(1,3,1); imagesc(A);
B=squeeze(brainData(:,:,20));
subplot(1,3,2); imagesc(B);
C=squeeze(brainData(:,:,30));
subplot(1,3,3); imagesc(C);
```

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