

ge_voxel

July 7, 2020

```
[23]: import numpy as np
import matplotlib.pyplot as plt
import suspect
import pydicom
```

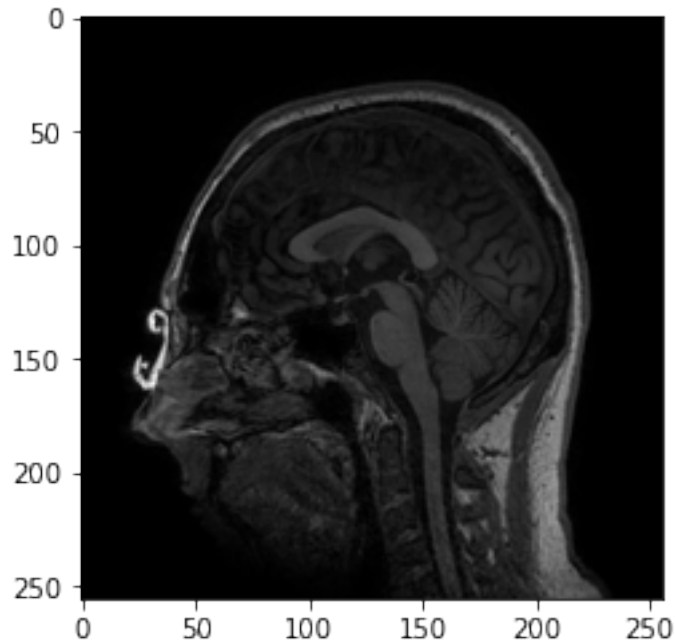
```
[9]: data, wref = suspect.io.load_pfile("275999EA/4_1218_PROBE-SV-TE25_te25_tr1500.
↪7")
```

```
2
{'acquiredXRes': 4096, 'acquiredYRes': 14, 'channels': 8, 'echoes': 1,
'imageXRes': 512, 'imageYRes': 512, 'phases': 1, 'slices': 1}
(1, 14, 8, 4096)
```

```
[28]: #t1 - sagittal fspgr
#ref - 3 reference planes
```

```
[11]: plt.imshow(t1[100], cmap=plt.cm.gray)
```

```
[11]: <matplotlib.image.AxesImage at 0x7ff40bb8f450>
```



```
[13]: centre = data.to_scanner(0,0,0)
      print(centre)
```

```
[-47.90339661 -1.00376892 36.91921234]
```

```
[15]: t1_origin = t1.to_scanner(0,0,0)
      #origin - bottom, left hand corner
      print(t1_origin)
```

```
[ 119.397 -168.437 129.271]
```

```
[43]: centre_in_image_space = t1.from_scanner(centre).round().astype(int)
      print(centre_in_image_space)
```

```
[159  88 139]
```

```
[50]: # prepare corners for axial section
      corners = [[-0.5, -0.5, 0],
                 [0.5, -0.5, 0],
                 [0.5, 0.5, 0],
                 [-0.5, 0.5, 0],
                 [-0.5, -0.5, 0]]
```

```
[53]: corners_in_image_space = np.array([t1.from_scanner(*data.to_scanner(*coord))
      ↪for coord in corners])
      print(corners_in_image_space)
```

```
[[149.3853134  87.56213867 147.85195819]
 [149.15262904  87.56213867 131.18654631]
 [168.11393962  87.56213867 130.98203615]
 [168.34662397  87.56213867 147.64744804]
 [149.3853134  87.56213867 147.85195819]]
```

```
[57]: [data.to_scanner(*coord) for coord in corners]
```

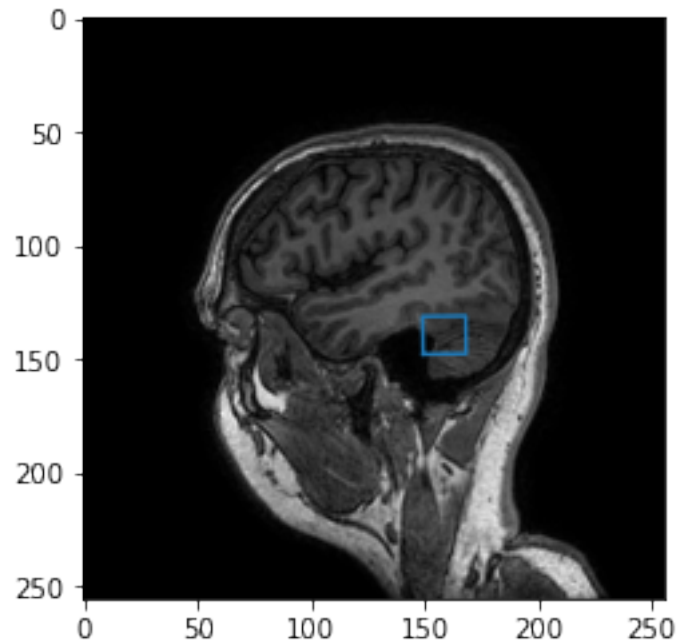
```
[57]: [array([-58.02534983, -10.88030996,  36.91921234]),
 array([-38.02685557, -11.12572215,  36.91921234]),
 array([-37.78144338,   8.87277212,  36.91921234]),
 array([-57.77993764,   9.11818431,  36.91921234]),
 array([-58.02534983, -10.88030996,  36.91921234])]
```

```
[ ]: #check by plotting orthogonal planes
#volume[slice,row,column] <- volume[z,y,x]
```

```
[69]: #volume[SLICE,row,column]
plt.imshow(t1[139], cmap=plt.cm.gray)

plt.plot(corners_in_image_space[:, 0], corners_in_image_space[:, 2]) #BAD
```

```
[69]: [<matplotlib.lines.Line2D at 0x7ff40169cb10>]
```

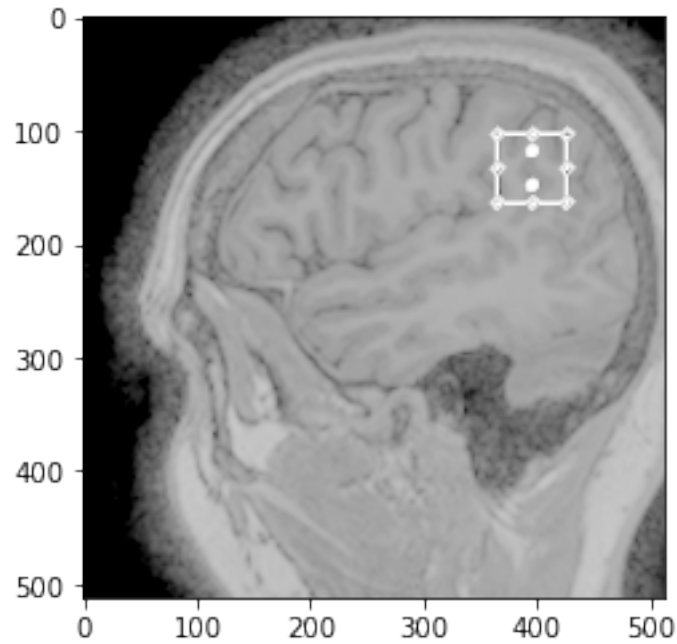


```
[ ]:
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[]:

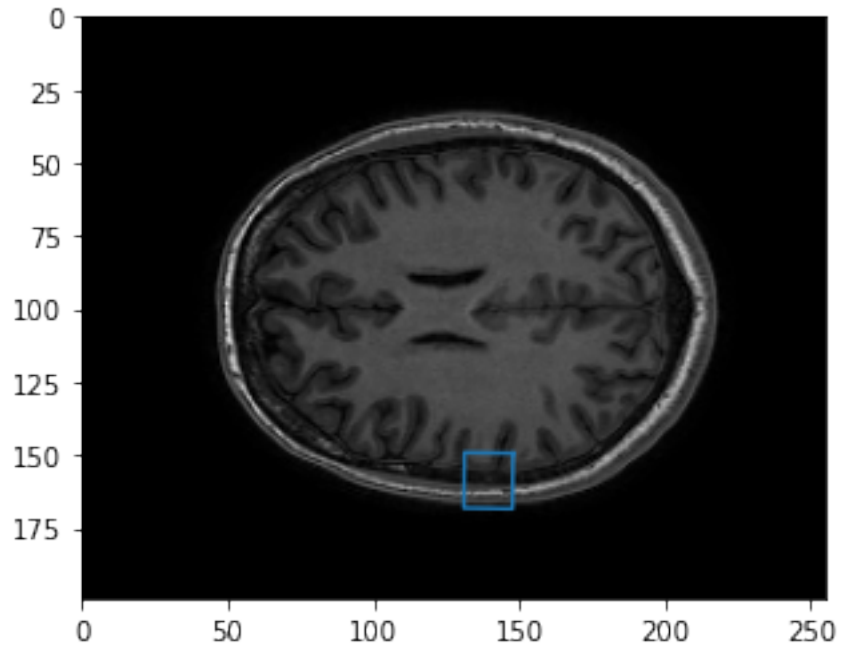
```
[42]: from matplotlib.colors import LogNorm  
plt.imshow(ref2.pixel_array, cmap=plt.cm.gray, norm=LogNorm())
```

[42]: <matplotlib.image.AxesImage at 0x7ff401cc9790>



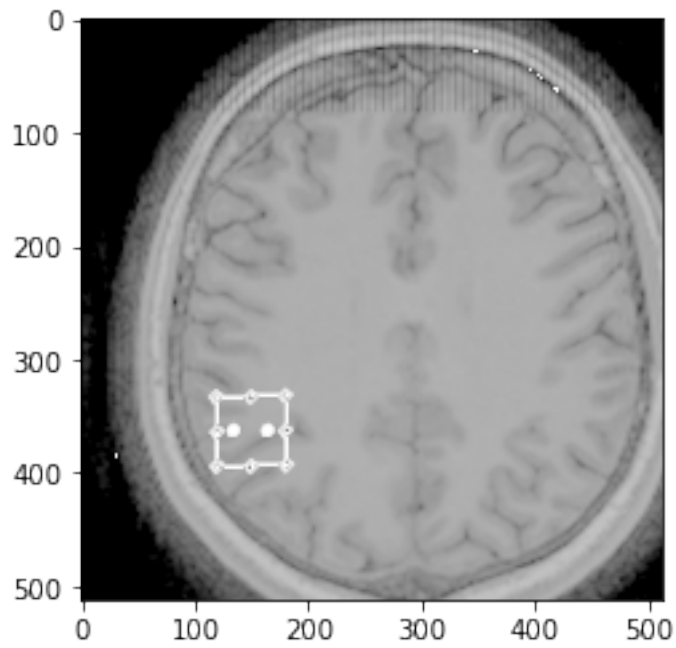
```
[58]: plt.imshow(t1[:,88], cmap=plt.cm.gray)  
plt.plot(corners_in_image_space[:, 2], corners_in_image_space[:, 0]) # BAD TOO  
  
plt.xlim([0, t1.shape[2] - 1]) #padding off  
plt.ylim([t1.shape[0] - 1, 0]) #padding off
```

[58]: (199.0, 0.0)



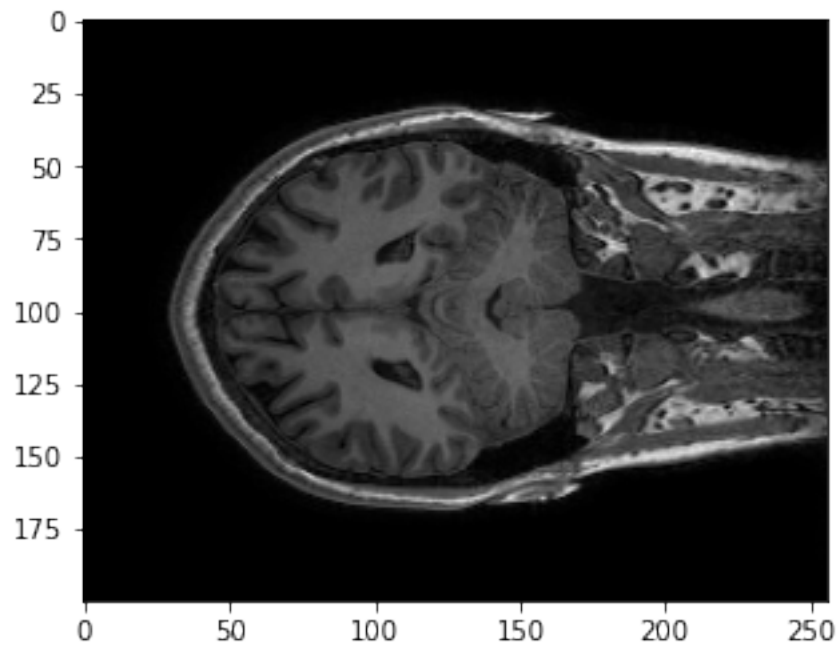
```
[38]: plt.imshow(ref3.pixel_array, cmap=plt.cm.gray, norm=LogNorm())
```

```
[38]: <matplotlib.image.AxesImage at 0x7ff401af31d0>
```



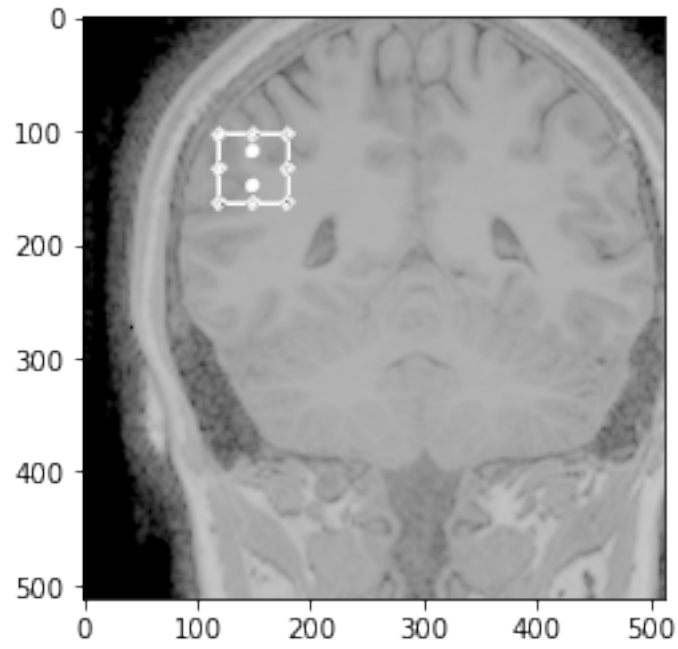
```
[20]: plt.imshow(t1[:, :, 159], cmap=plt.cm.gray)
```

```
[20]: <matplotlib.image.AxesImage at 0x7ff40a8b0b50>
```



```
[40]: plt.imshow(ref1.pixel_array, cmap=plt.cm.gray, norm=LogNorm())
```

```
[40]: <matplotlib.image.AxesImage at 0x7ff4019830d0>
```



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