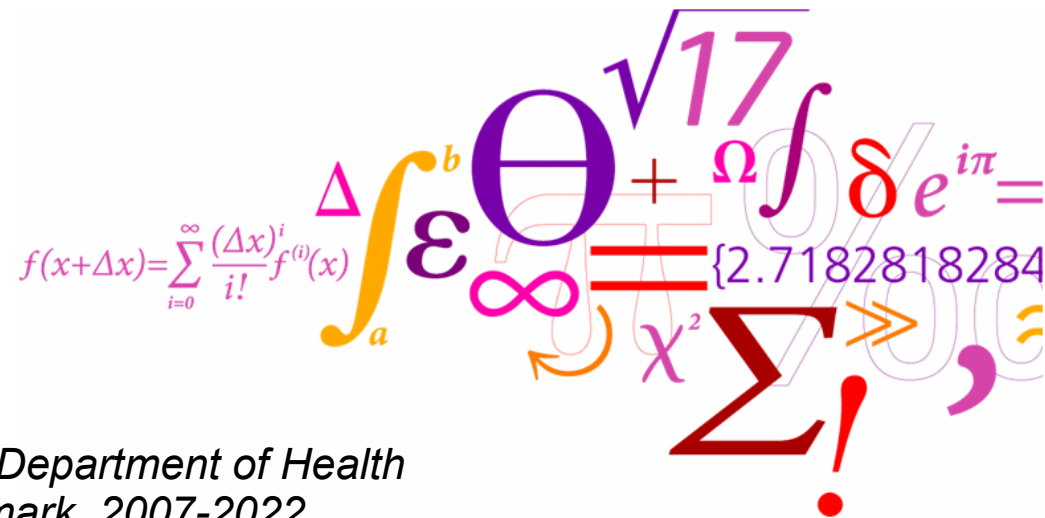


Tips on working: *Report and handling data*

Jens E. Wilhjelm

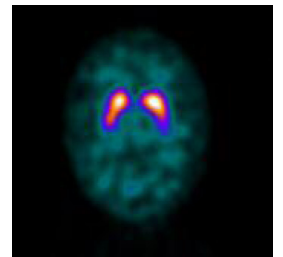
(with assistance by Sofie Rahbek and Mads Fjelbro Klavsén)

Biomedical Engineering
Department of Health Technology

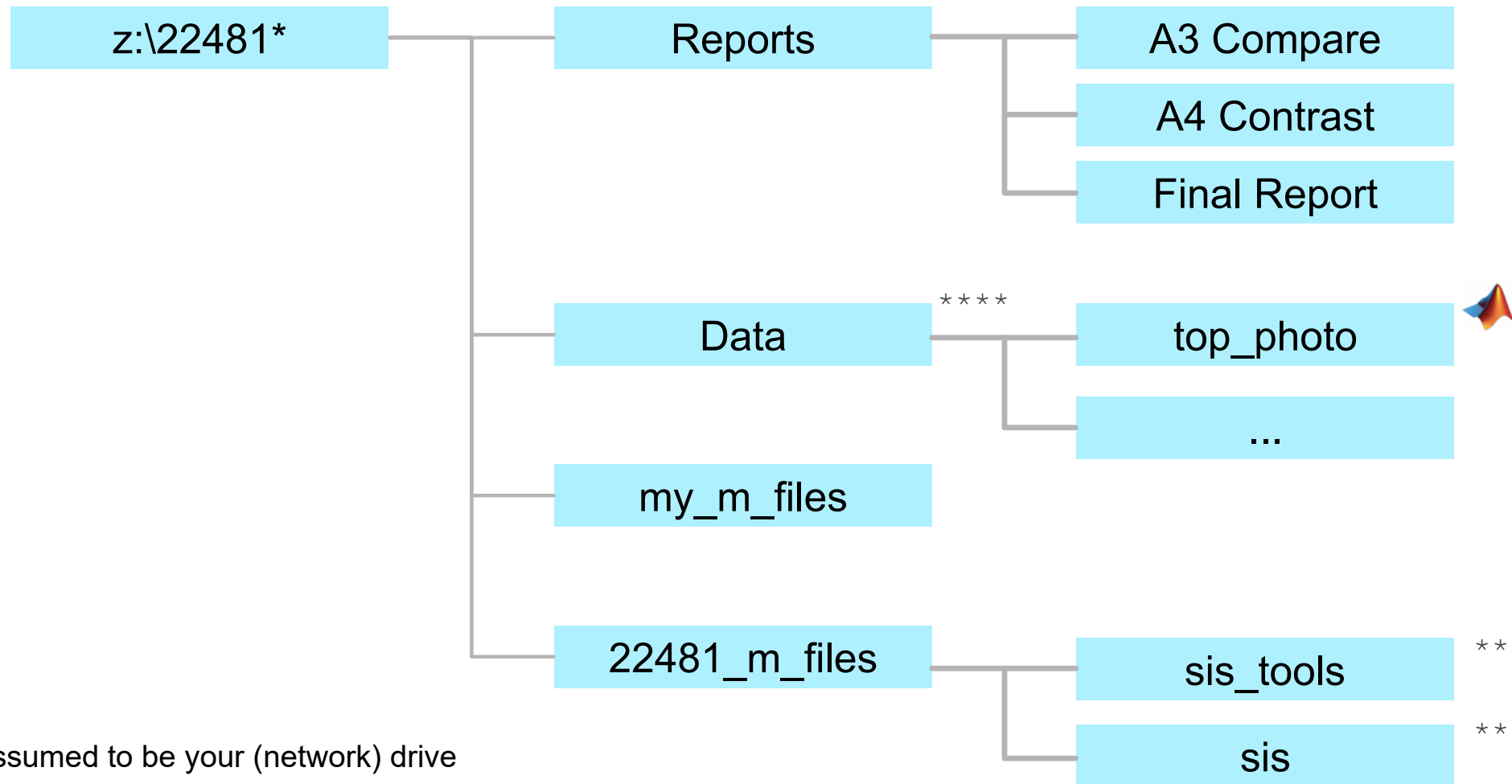


Content

- Directories with data and programs
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Suggestion of structure of m-files, documents and data



* z:\ is assumed to be your (network) drive

** Unpack sis_tools.zip and sis.zip here

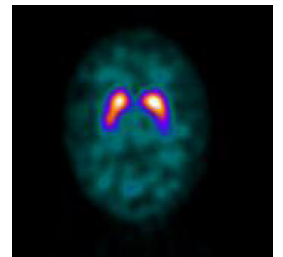
 MATLAB should be working in one of these subdirectories

**** File startup.m with content:

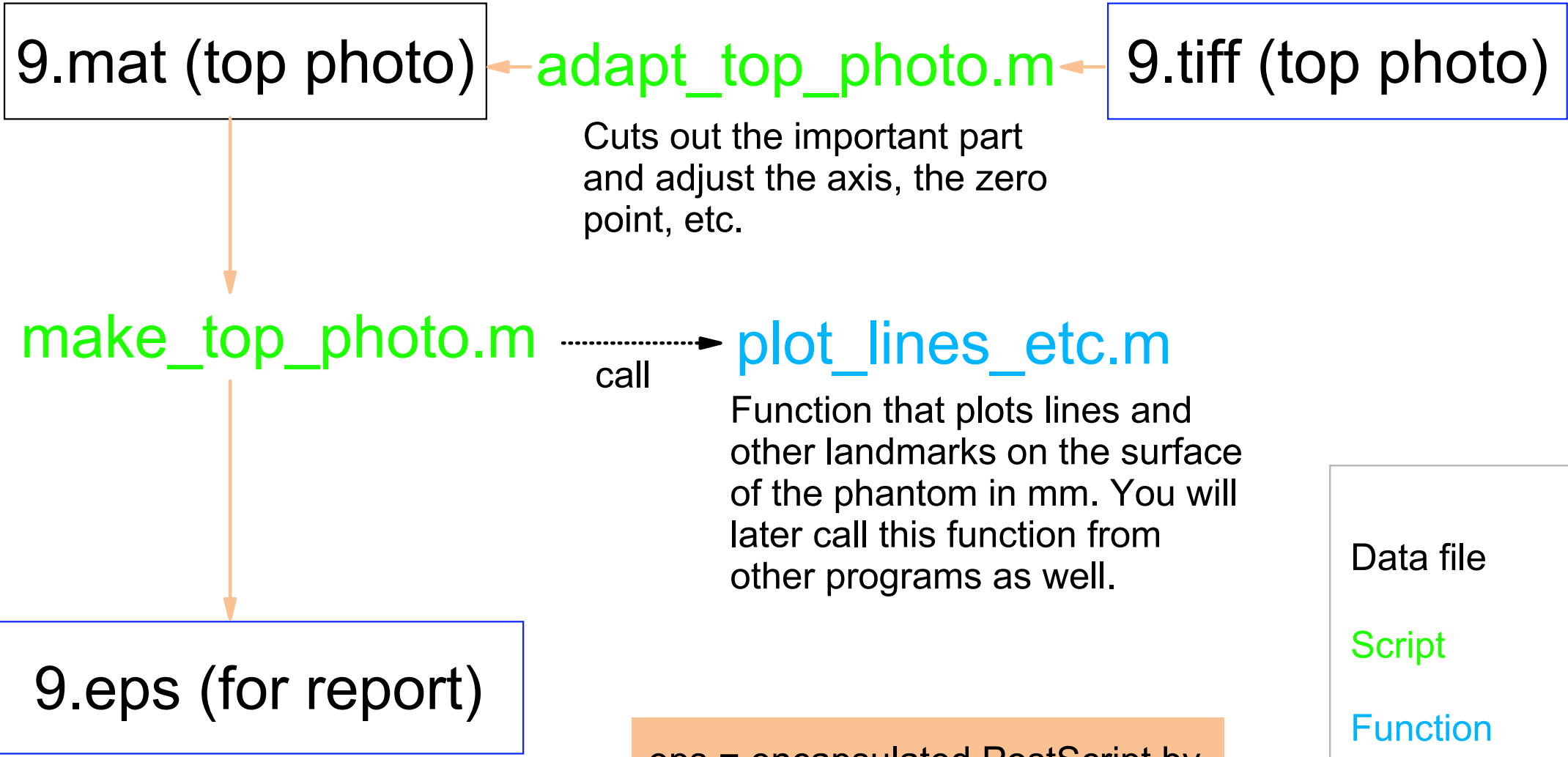
```
path( path, '\22481_m_files\sis_tools');  
path( path, '\22481_m_files\sis');  
path( path, '\my_m_files\');
```

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A way to handle the top photo



Cuts out the important part and adjust the axis, the zero point, etc.

Function that plots lines and other landmarks on the surface of the phantom in mm. You will later call this function from other programs as well.

eps = encapsulated PostScript by Adobe. cgm = computer graphics metafile. Both can contain vector graphics and bitmapped images.

Data file

Script

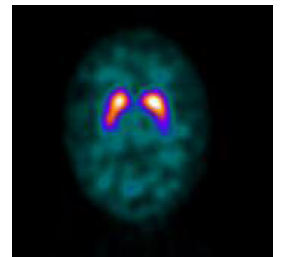
Function

↓ = data flow

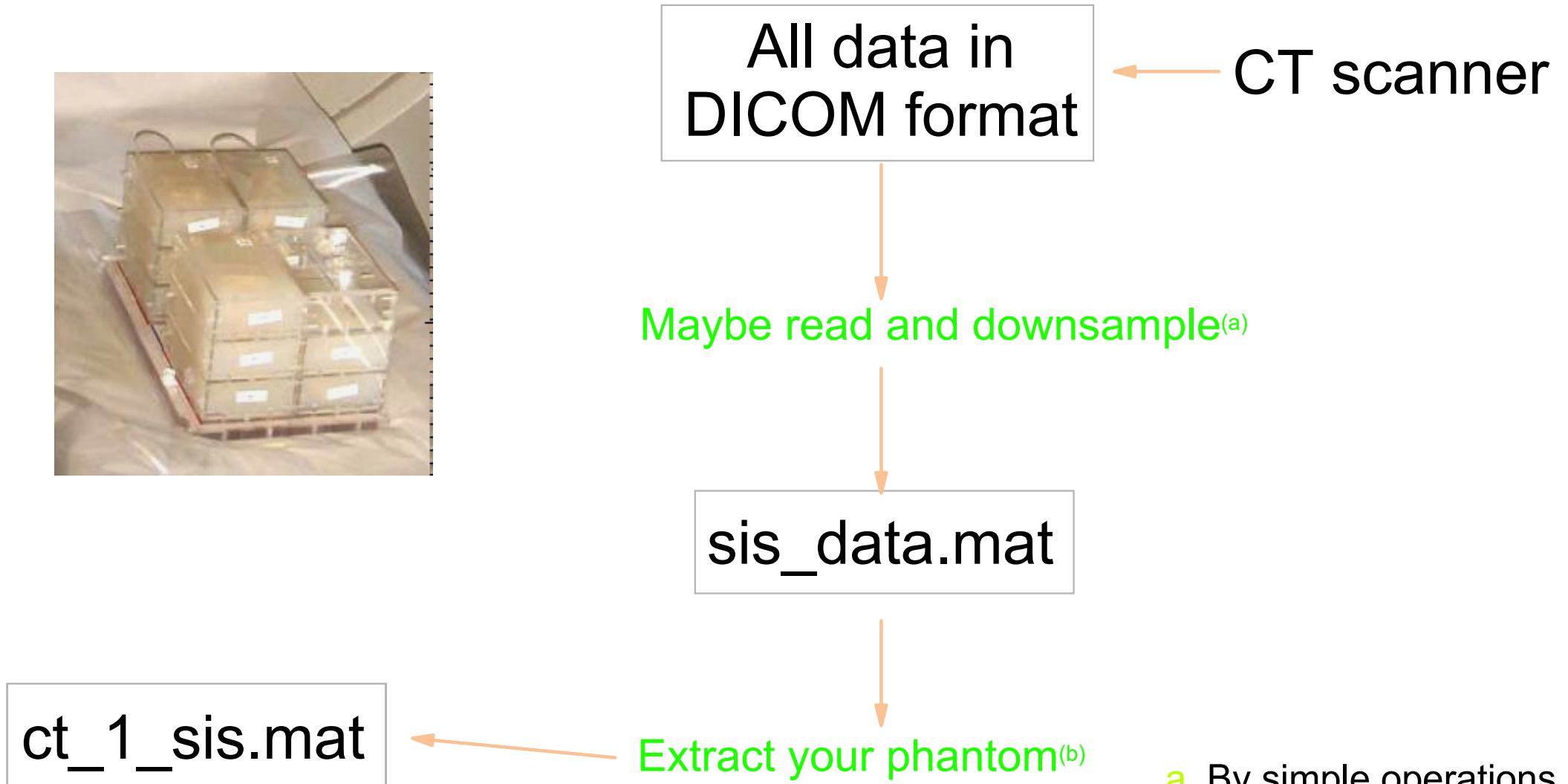
Graphic file for your report. Could also be 9.cgm, etc.

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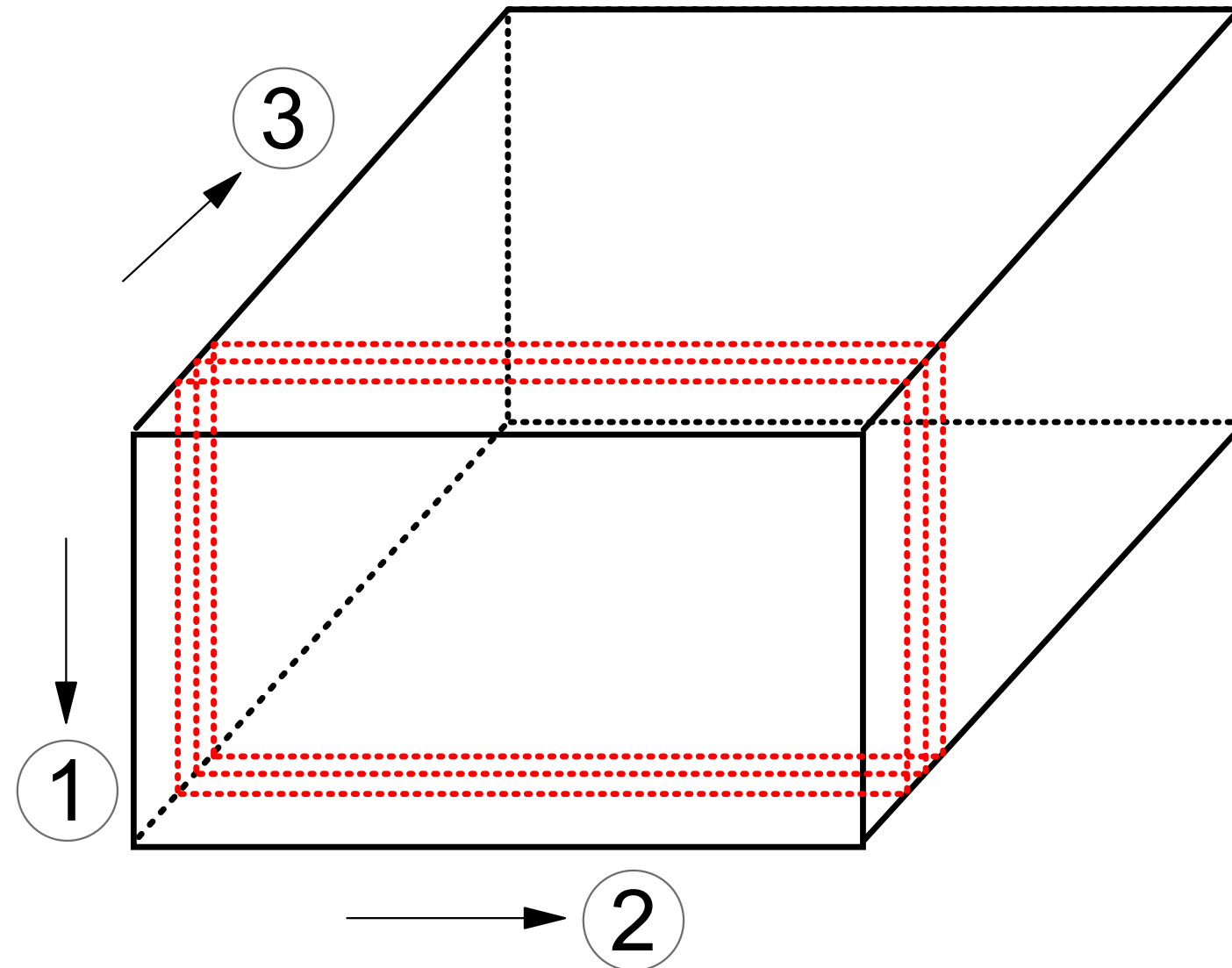
PET - CT



a. By simple operations on data *and* axis

b. By `sis_zoom`

PET - CT



Investigate voxel
size in MATLAB!

PET - CT

```
load Data; % PET data from fall 2007
```

```
sis_extract_axis_info(Data);
```

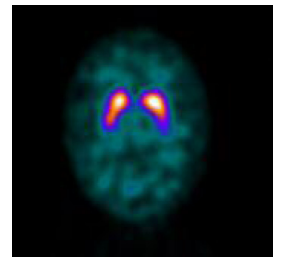
	Arg 1	Arg 2	Arg 3
Start of axis:	86.00000	40.00000	-5.73986 mm
End of axis:	214.00000	210.00000	288.26015 mm
Span of axis:	128.00000	170.00000	294.00001 mm
Mean delta:	2.00000	2.00000	2.00000 mm
Image size:	65	86	148 (i.e.827320 voxels)

```
Maximum value: 32767.00000 ?(6 voxels)
Mean value: 106.62967 ?
Minimum value: 0.00000 ?(519344 voxels)
```

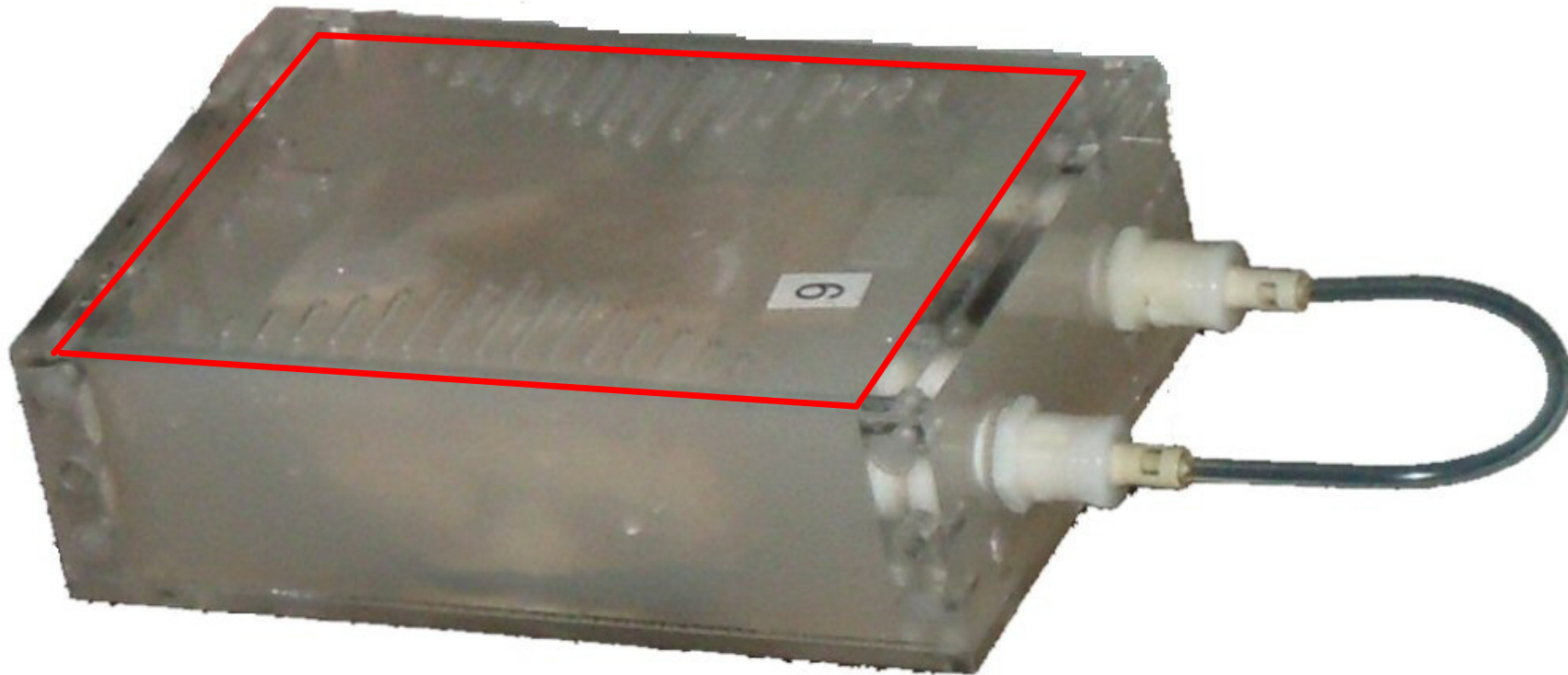
"Arg" and "Dim" are used interchangeably.

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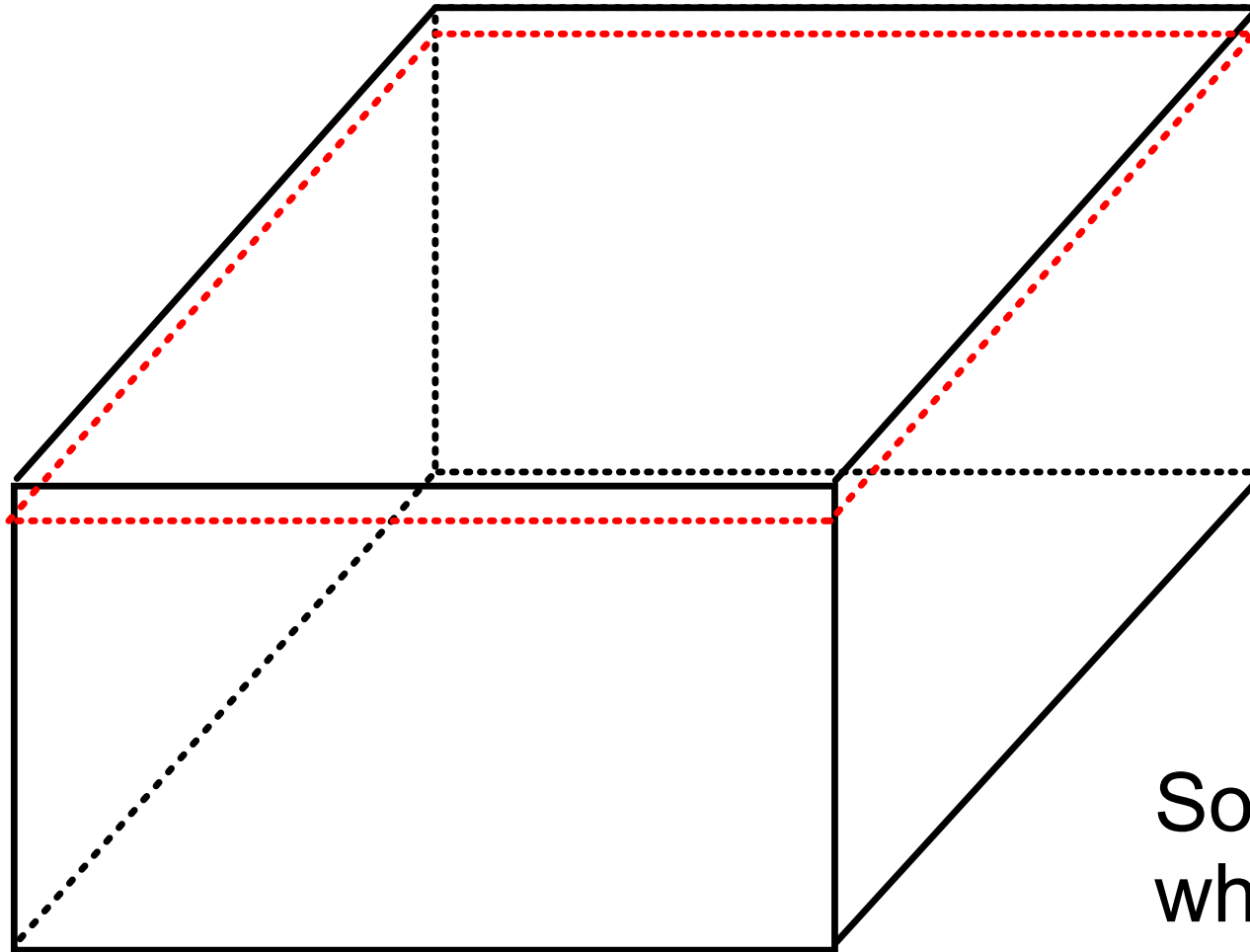


Fiducial markers



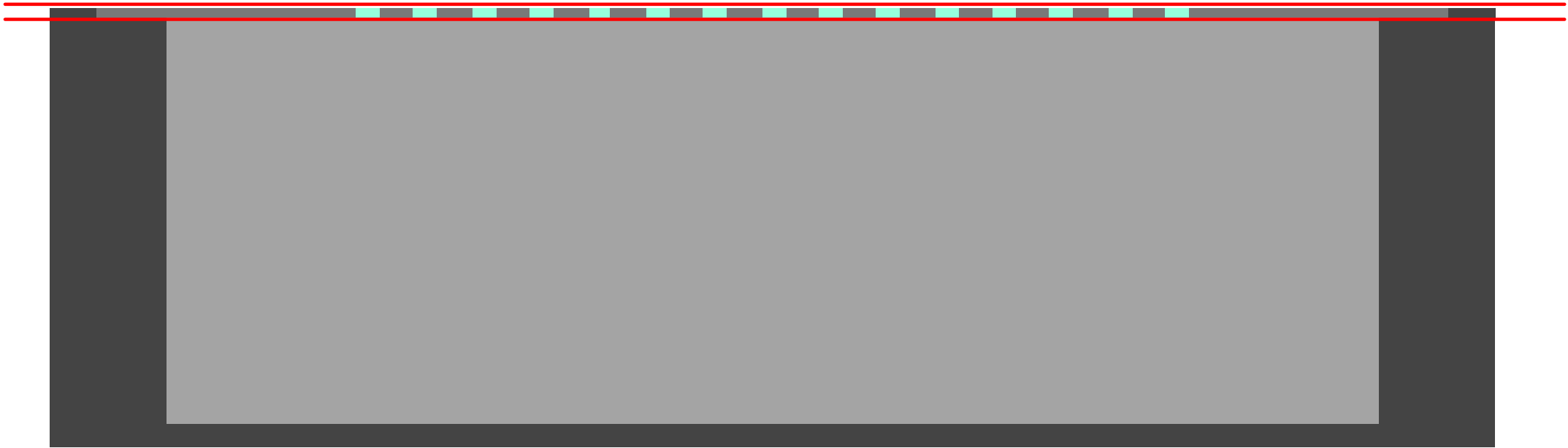
By use of `sis_zoom`, you should extract an image that is positioned as indicated by the red frame.

Fiducial markers

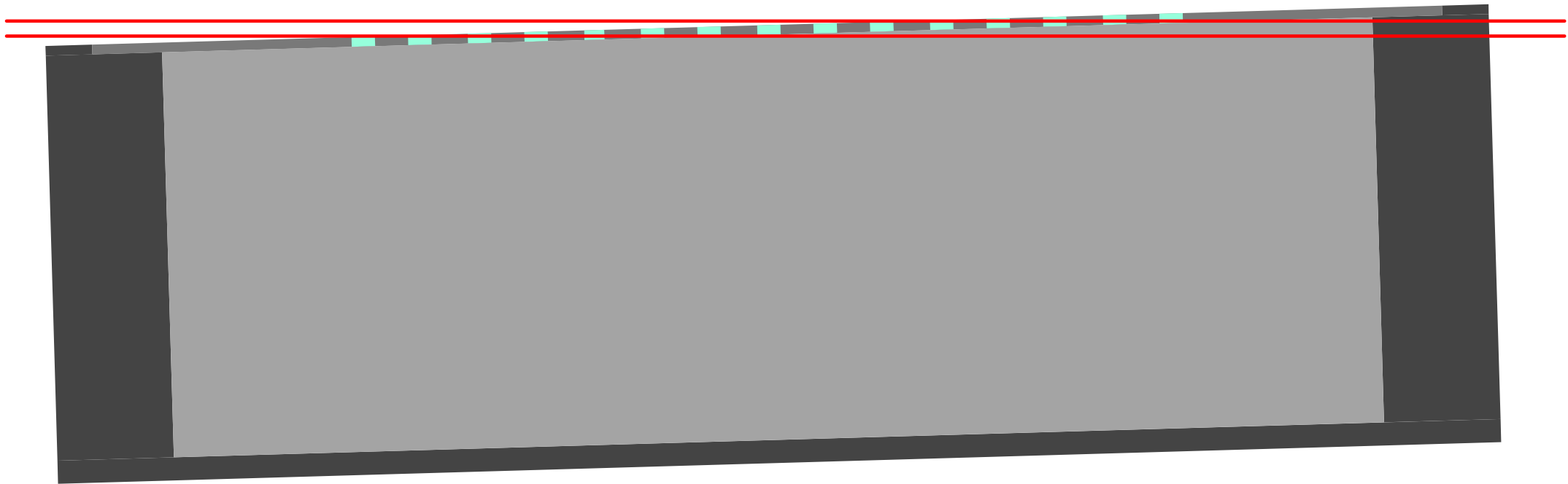


So dimension 1 is fixed,
while you should take all
data from dimensions 2
and 3.

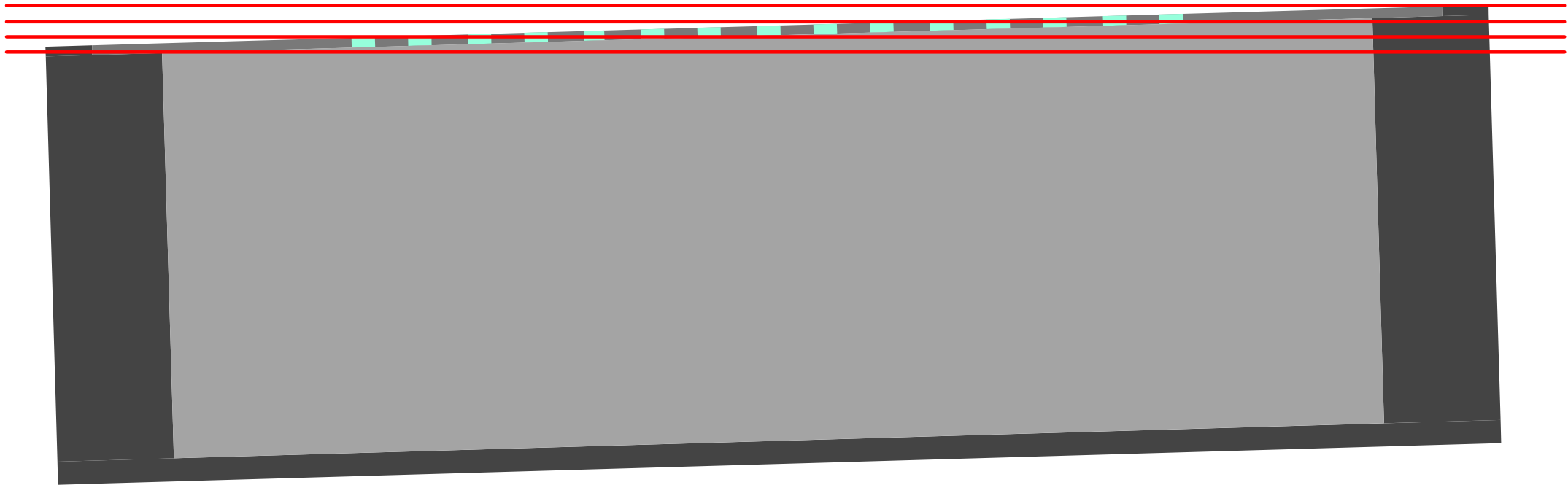
Phantom seen from the side



Phantom seen from the side

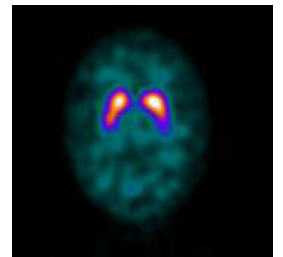


Phantom seen from the side



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Example: Visualization of PET data

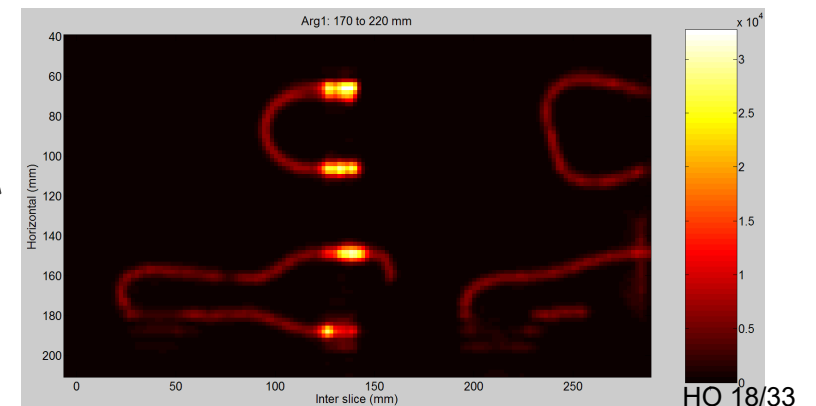
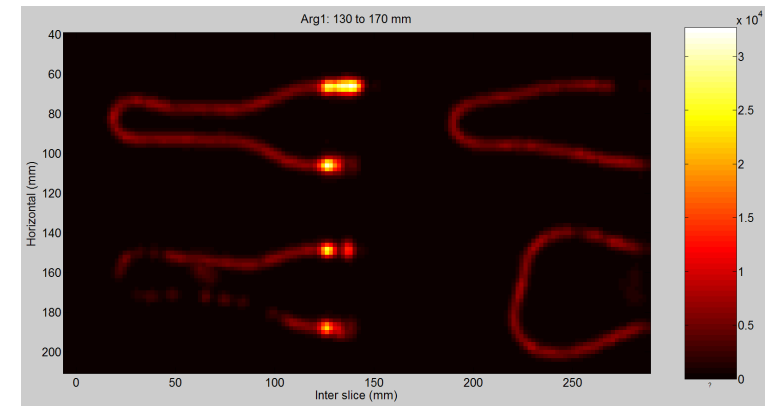
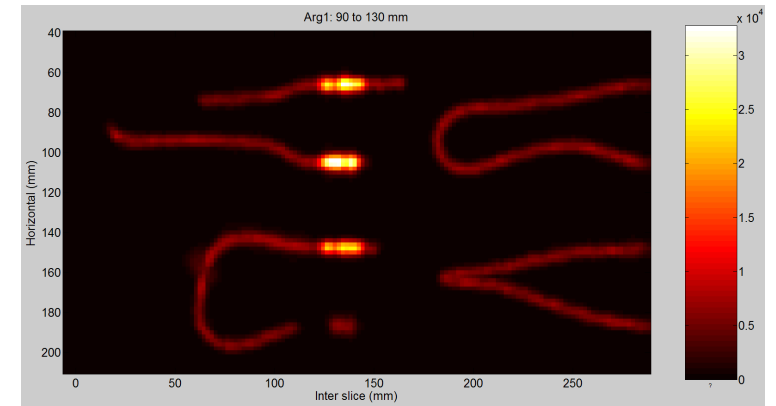
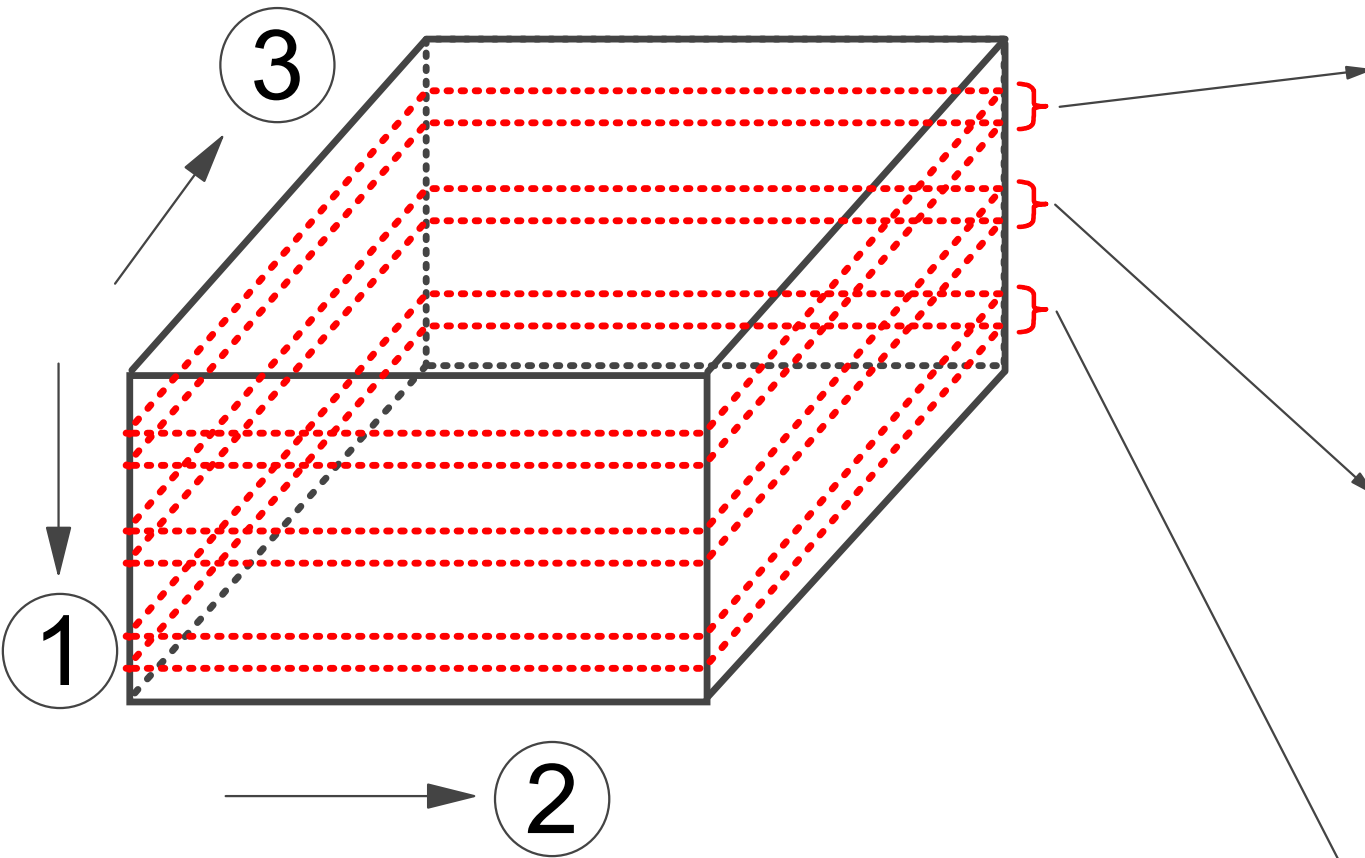


(Photo from an older scanning)

Example: Visualization of PET data

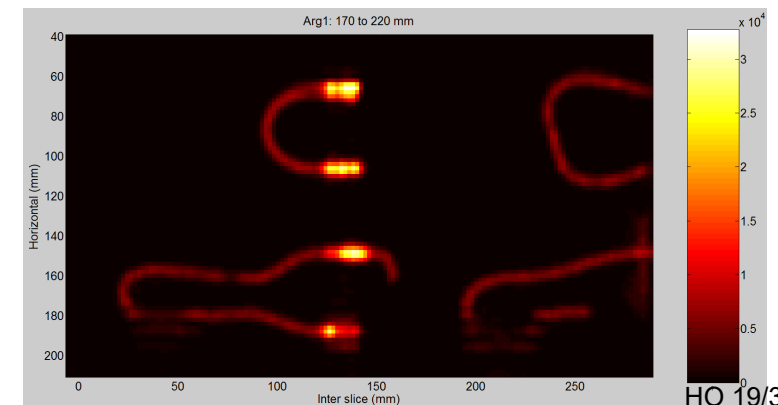
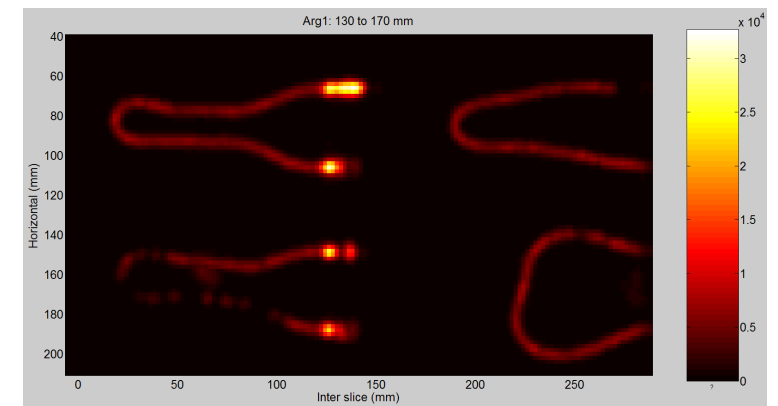
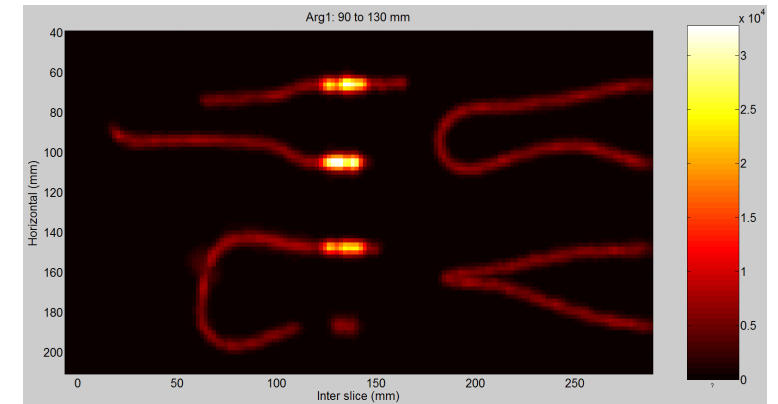
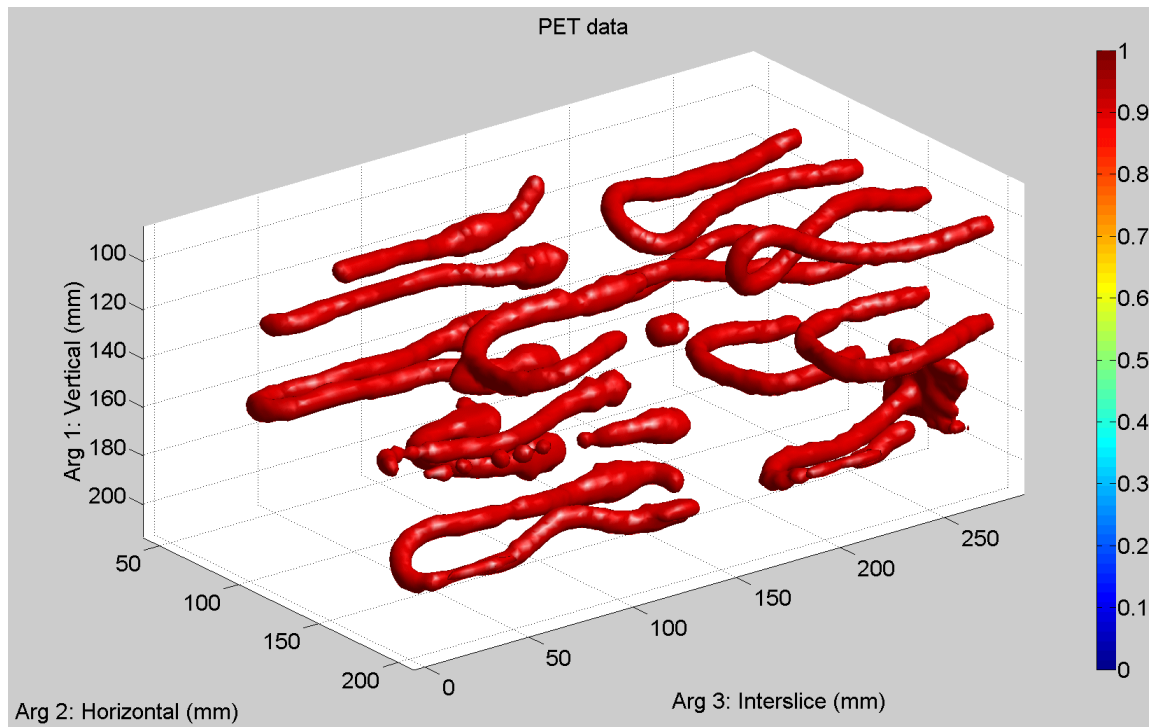
"Collapsed" volumes

3D PET data



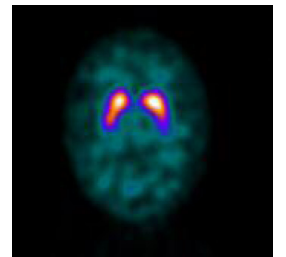
Example: Visualization of PET data

"Collapsed" volumes



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Example of materials and methods

The electrical part of the measurement system is depicted in Fig. 2. The ultrasound system consisted of a pulser/receiver (type 5072PR, Panametrics, Inc., MA) connected to a submersible transducer (to be described in Subsection 2.1). The amplified signal from the pulser/receiver was bandpass filtered to limit noise outside the useable frequency range of the particular transducer and digitized with a digital storage oscilloscope (DSO) (type 9450, LeCroy, Genève, Switzerland). The DSO was in turn connected via a general purpose interface bus (GPIB) interface to a control computer running MS Windows. By means of an RS232 interface, a 3D translation system (type 403020, Dyrbæk Technologies, Åbenrå, Denmark) was connected to this control computer as well.

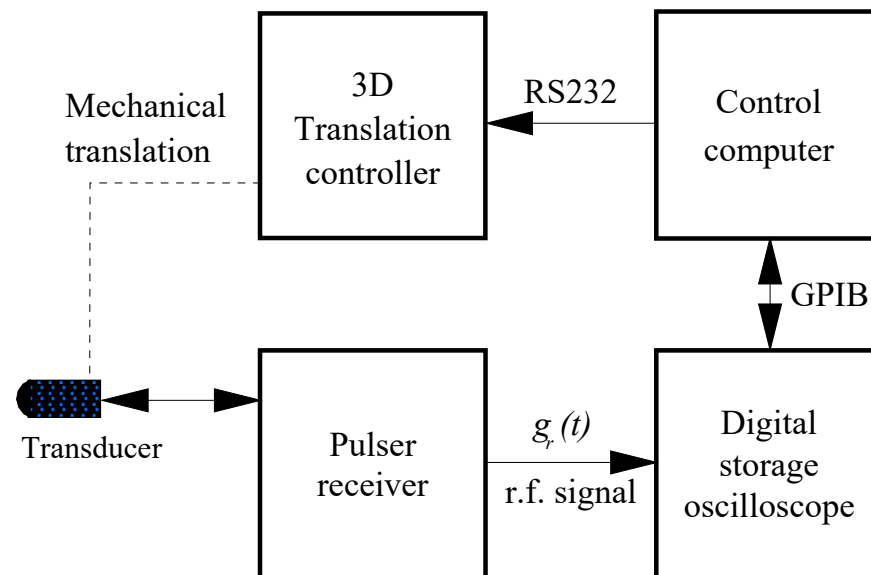


Figure 2. Block diagram of the electrical part of the measurement system.

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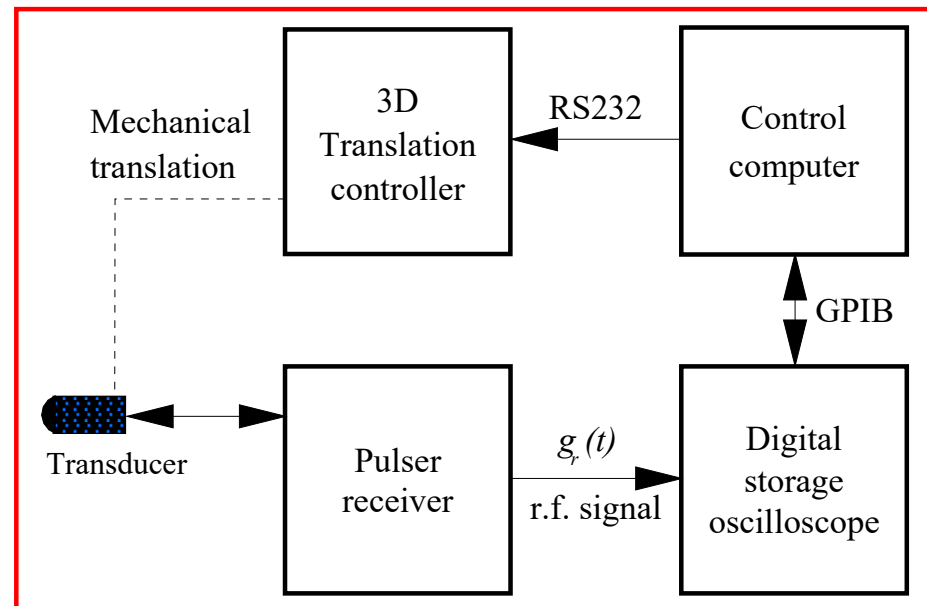


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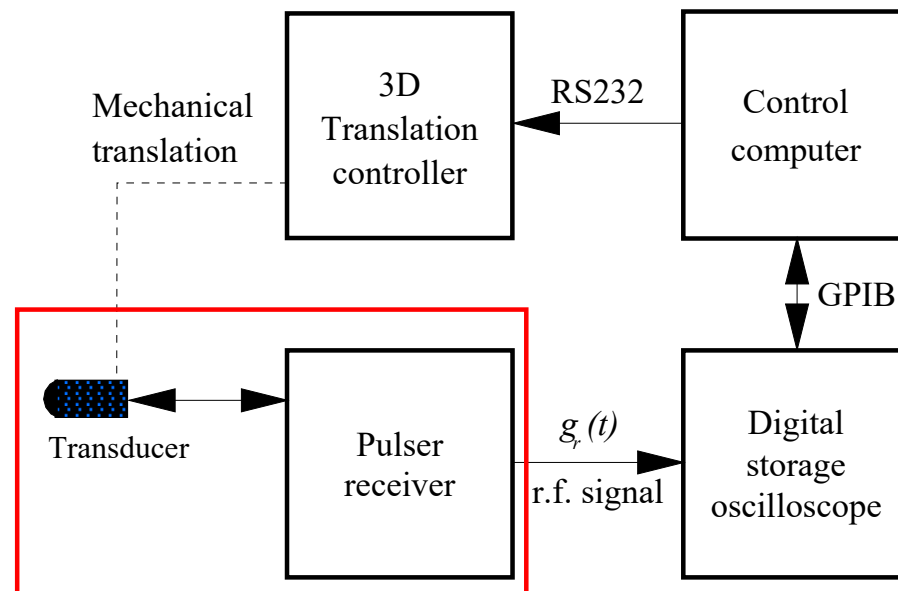


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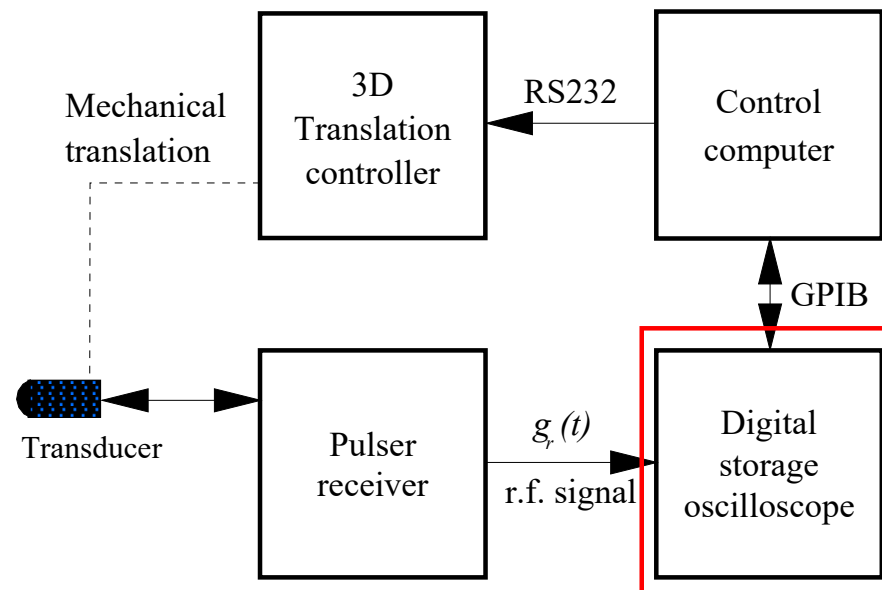


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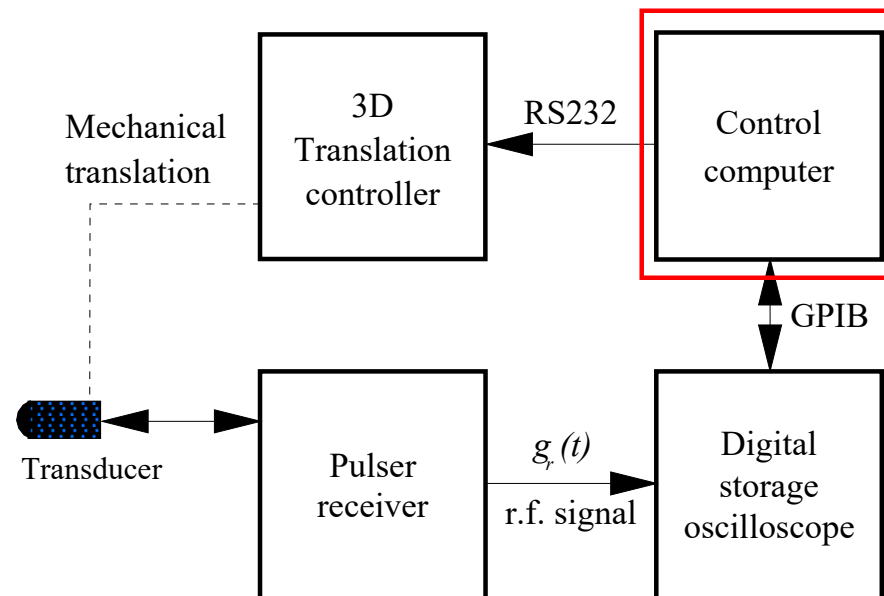


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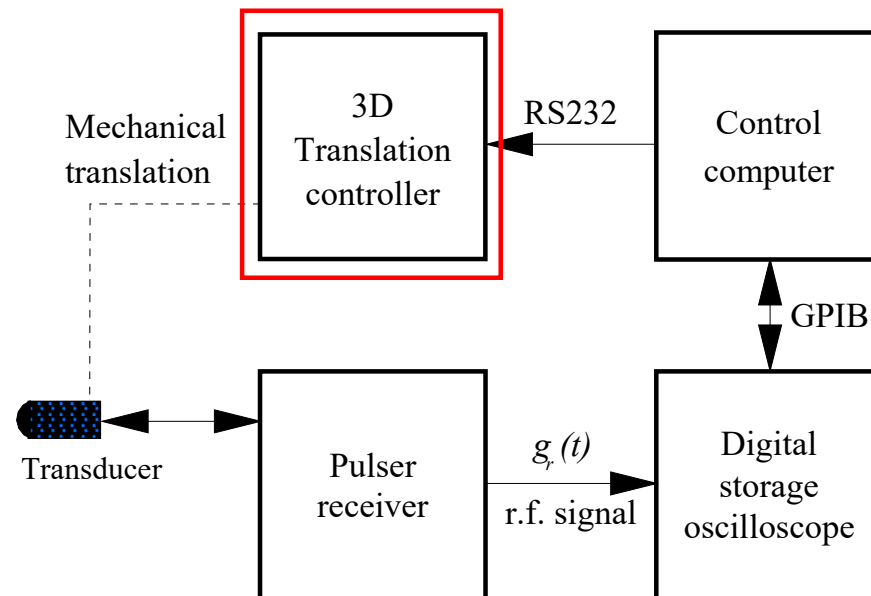


Figure 2. Block diagram of the electrical part of the measurement system.

Borrowing from others

(Photo removed)

Figure 1. Example of popular/unpopular behavior.

What's "wrong" here?

$I_{(xi)}$	<i>Intensitet af medium (xi) [W/m²]</i>
γ	<i>Gyromagnetisk ratio – 42MHz/T for fotoner</i>
μ_m	<i>Lineær dæmpningskoefficient for pågældende voxel [m⁻¹]</i>
μ	<i>Dæmpning</i>
μ	<i>Middelværdi</i>
λ	<i>Bølgelængde [nm]</i>
^{18}F	<i>Fluodeoxyglucose</i>

Last, but not least...

- Write all the text yourself, or make citations with references
- Keep
 - reading the text book and
 - writing your report

as two *seperate* tasks!

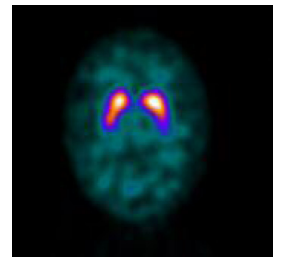
Last, but not least...

Alternatives, that are *not* plagiarism:

- Write all the text yourself in your own words:
 - High grade, if correct. 😊
- Write the text in a way that is close (but not identical) to the reference:
 - Low grade. 😐
- Purely copy paste with citation marks and references:
 - Very low grade. 😞

Content

- Directories with data and programs
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Peer review

Student 1	A1 08-09-16 (s061).pdf	8. september 2016 21:26	<ul style="list-style-type: none"> ✓ Student 14 (s144) ✓ Student 19 (s144) ✓ Student 2 (s144) 	
Student 2	Assignment_1.pdf	8. september 2016 22:09	<ul style="list-style-type: none"> ✓ (s136) ✓ (s144) ✓ (s144) 	
Student 3	Assignment A1.pdf	8. september 2016 22:26	<ul style="list-style-type: none"> ✓ (s123) ✓ (s136) ✓ (s144) 	

	Student 14	Student 19	Student 2
Purpose			
Method			
Processing of image			
Axes			
Fiducial markers			
Additional fiducial markers			
Geometry			
Zero point			
MATLAB code			

Se uddybende
begrundelser

Se uddybende
begrundelser

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begrundelser

(The two figures here are from different data sets)

A1

- `draw_fiducials_on_phantom;`
 - ▶ `plot(bla)`
 - ▶ `circle(bla)`

- `draw_fiducials_on_phantom(Data, FiducialPoints, etc);`
 - ▶ `sis_view(Data);`
 - ▶ `plot(bla)`
 - ▶ `circle(bla)`