

Institute of Neuroscience and Medicine  
Medical Imaging Physics (INM-4)

Georgian Technical University  
Faculty of Informatics and Control Systems



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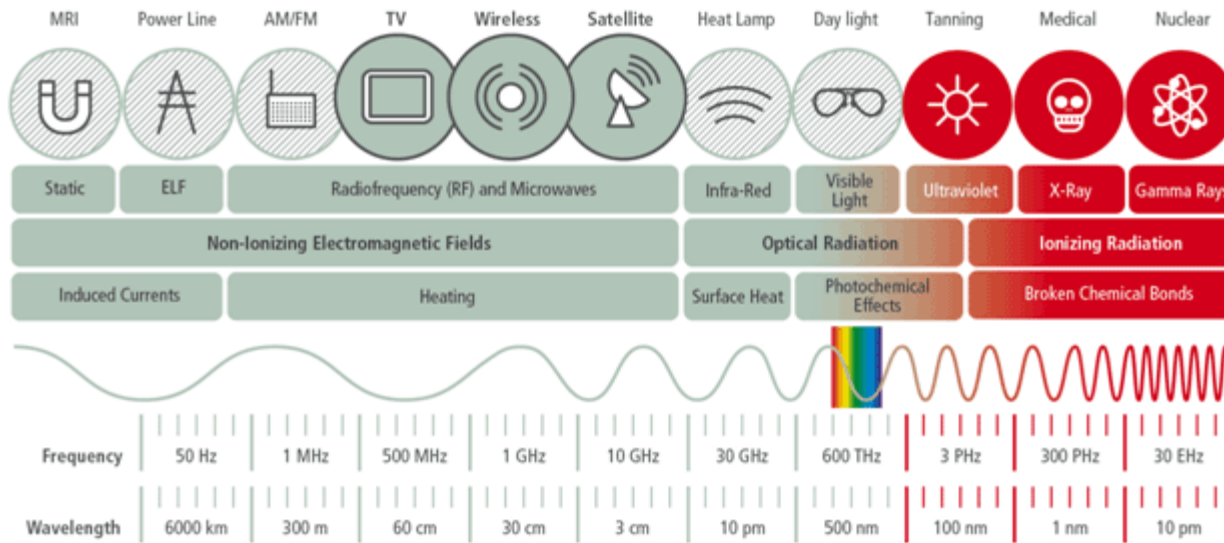
**Autumn Lectures In Tbilisi**

# MRI

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# X-ray

3T: 128Mhz



## MRI and CT twice gets topographic pictures, but them have almost difference principles !

Advantages of MRI is next:

Non-ionising	<i>Using radio-waves, not X-rays</i>
Non-invasive	<i>No contrast agents required</i>
Soft-tissue sensitive	<i>MRI signal ~ Proton density <math>\rho</math> ~ H<sub>2</sub>O</i>
Quantitative	<i>MRI signal ~ Magnetisation = <math>f(\rho, T_1, T_2, T_2^*, D, \alpha, \dots)</math></i>
Multi-contrast	<i><u>Technical configuration</u> (sequences) / <u>parameters</u></i>
Multi-purpose	<i>Anatomy, activity, connectivity, vessels . . . .</i>
Oblique slices	<i>Flexible spatial encoding with arbitrary image slice orientation</i>

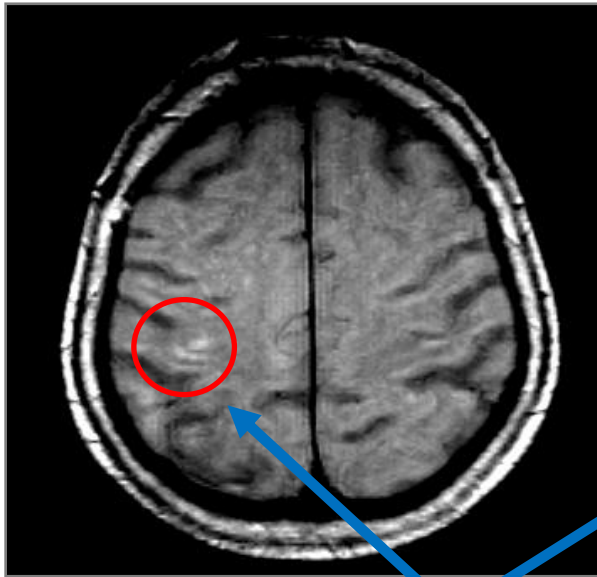
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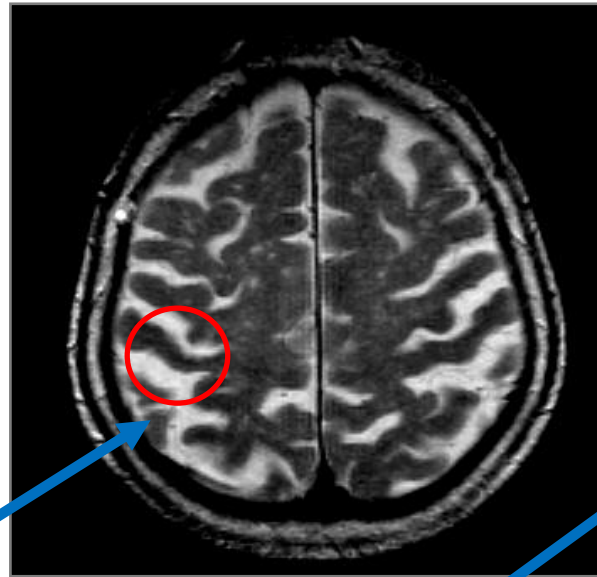
# Image difference depend on parameters

$T_1$



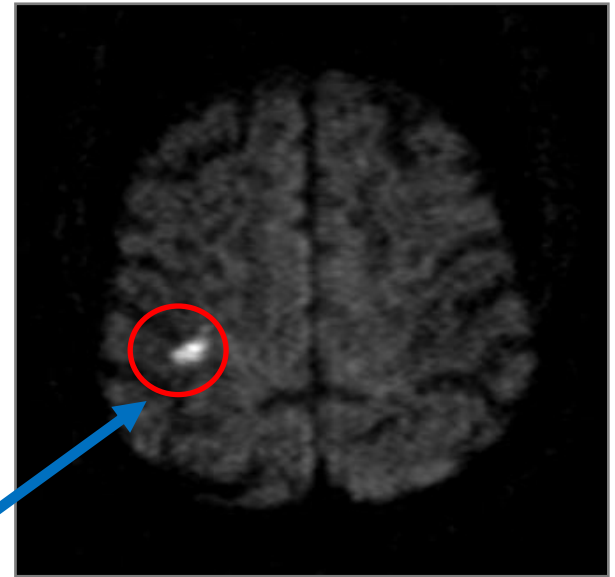
??

$T_2$



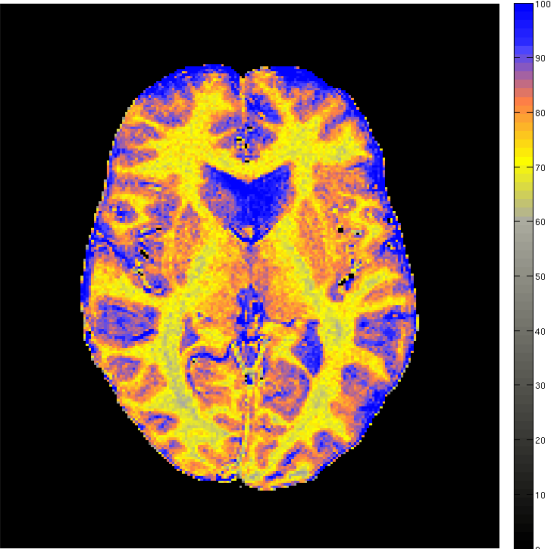
Acute stroke (24 h after onset)

Diffusion

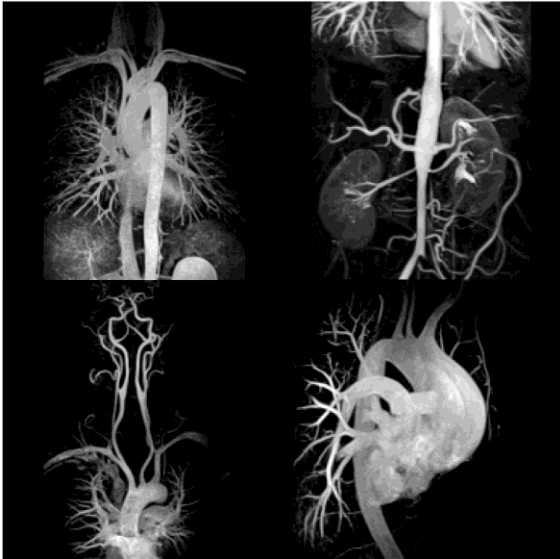




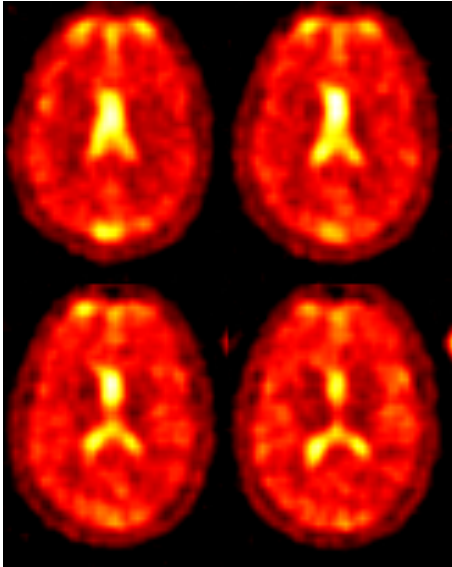
Watermap



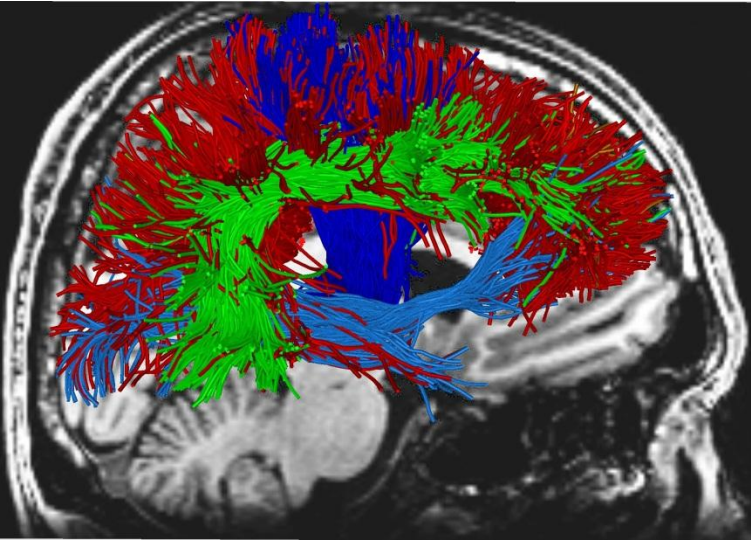
Angiography of the Aorta



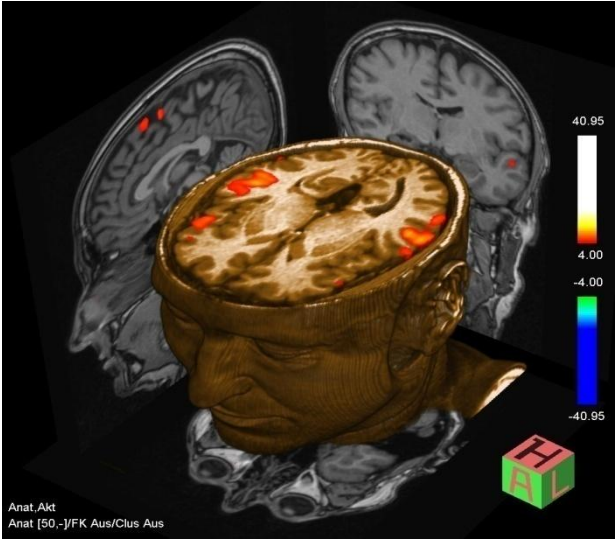
Metabolism



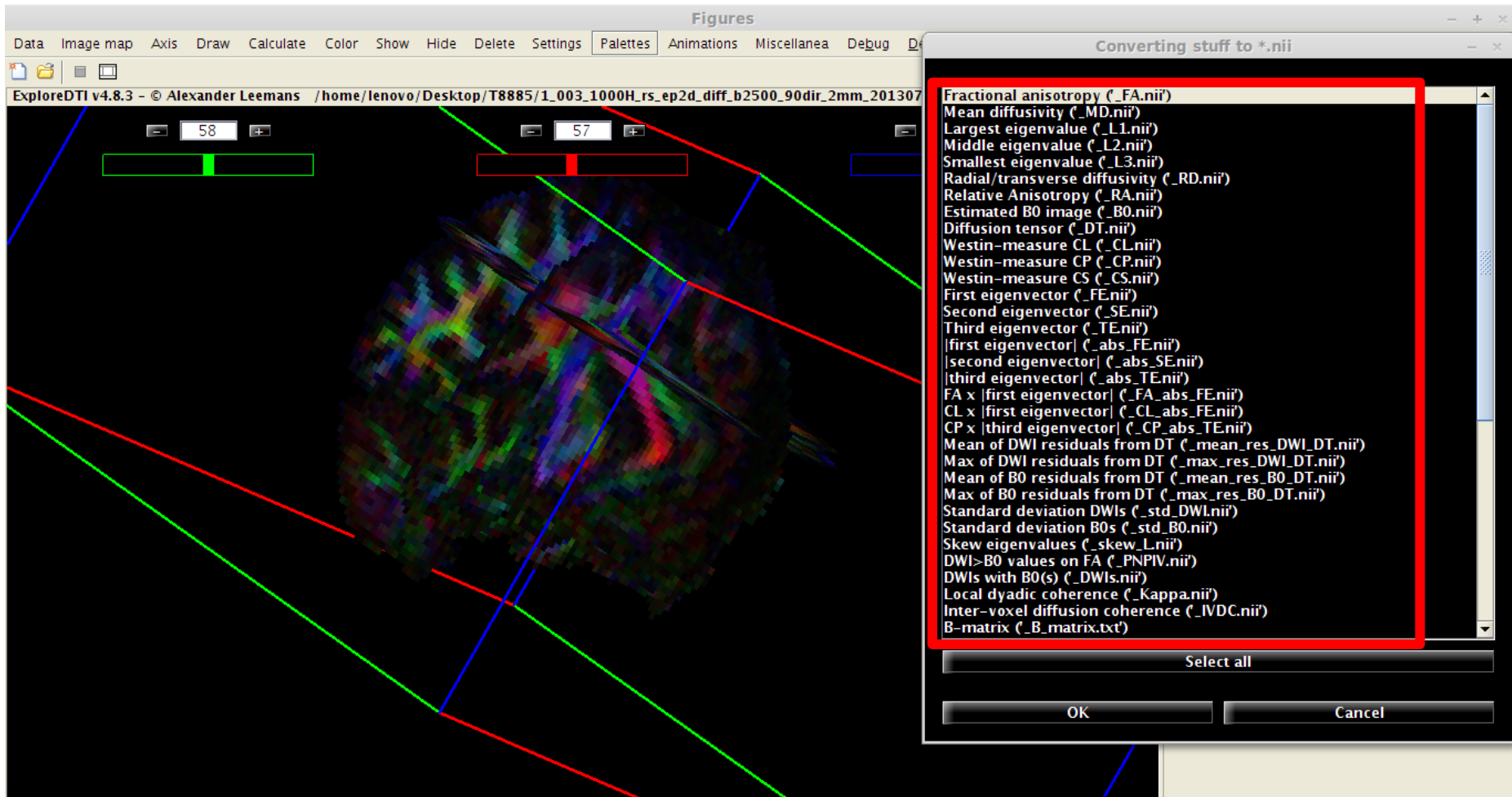
Connectivity/ Fibres (DTI)



Function/ Activity (fMRI)



# Calculating different parameters in "Matlab"



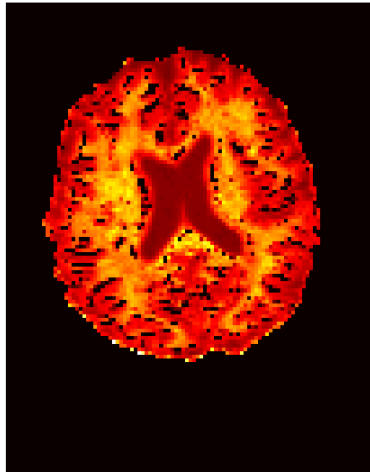


# Slice 42 MK

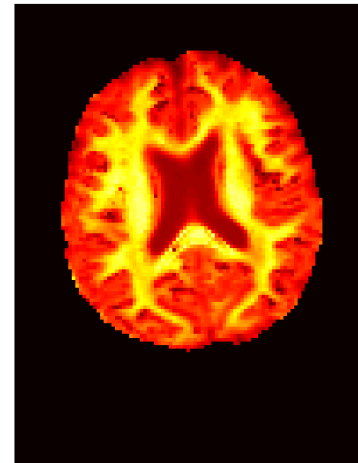
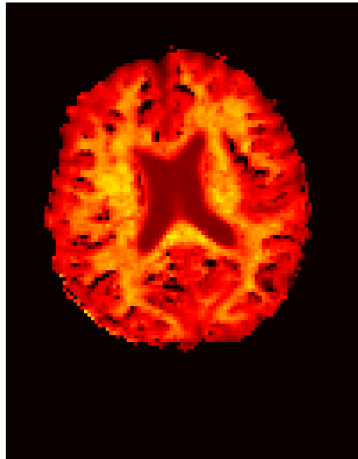
## Normal

## Fast

Without Correction



PI & Smoothing



<b>Date</b>	2013.11.13
<b>Subject</b>	
<b>Created T-number</b>	
<b>Series description</b>	ep2d_diff_30dir_3b
<b>Corrections</b>	Corregistration, PI, smoothing (Susan)
<b>Slice</b>	45
<b>Parrameters</b>	MD, RD, FA, MK, RK, KA, L1, B0, colorFA, AK, AWF, CL, AM, TORT, Mean_res_DWI_DT, FA_Skeleton
<b>Folder path</b>	

# Thanks:

Prof. dr. N. Jon Shah;

Dr. Farida Grinberg;

Ezequiel Farrher

Prof. Qetevan Kotetishvili;

Dr. Andro Kacharava

Prof. Akaki Gigineishvili;



**THANK YOU FOR  
YOUR ATTENTION .....**

