

Cost Action B11: Quantitative Analysis of MRI Texture

Joint Parameter Dependency and Normalization

Presentation:

Ivan Zuna
Petr Novak

Presentation

1. Selection of parameters

2. Interpretation of parameters

- 3D slab
- SNR
- voxel resolution
- TR
- TE
- FL

3. Normalization

- z axis dependency
- MR parameters dependency

4. Future work

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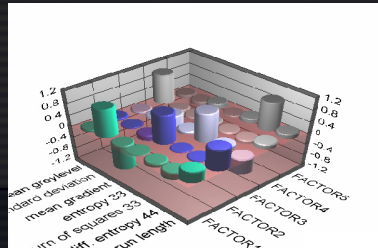
3. Normalization

- z axis dependency
- MR parameters dependency

4. Future work

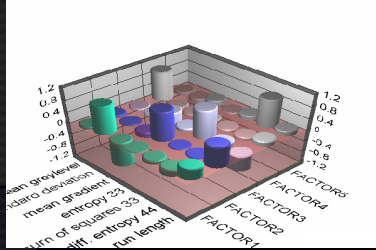
1. Selection of parameters

	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
mean greylevel	-0.07	0.07	-0.06	0.99	-0.10
standard deviation	0.96	0.01	0.03	-0.12	-0.13
mean gradient	-0.86	-0.16	0.36	-0.04	0.16
entropy 33	0.00	0.98	0.10	0.03	-0.02
sum of squares 33	-0.12	0.02	0.97	-0.05	0.15
diff. entropy 44	-0.21	0.03	0.13	-0.11	0.96
horiz. run length	0.36	0.70	-0.52	0.15	0.15



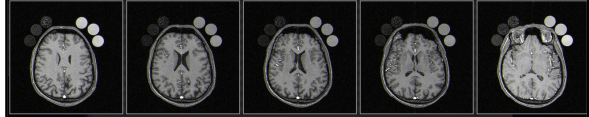
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2. Interpretation of parameters

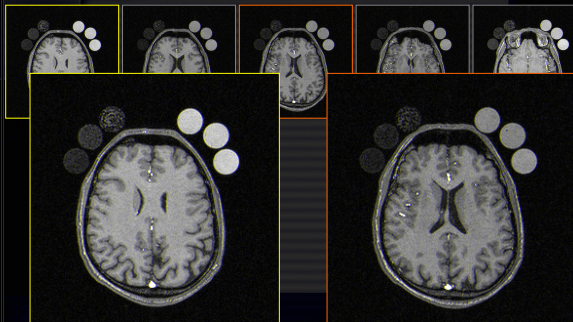
3D



TR = 20 ms TE = 6 ms FL = 30 °

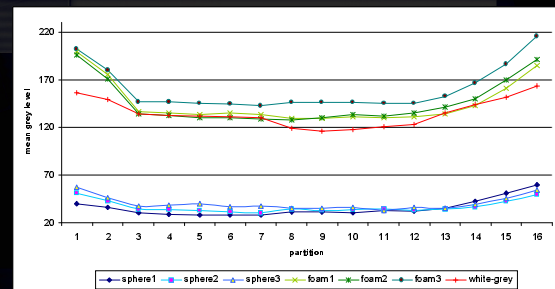
2. Interpretation of parameters

3D



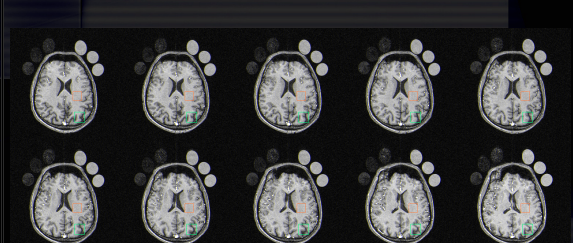
3. Normalization

3D - z axis dependency



2. Interpretation of parameters

3D

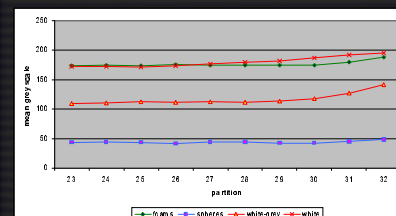


TR=30ms TE=6ms FL=30°

SNR=1.1 Voxel Resolution=1x1x1

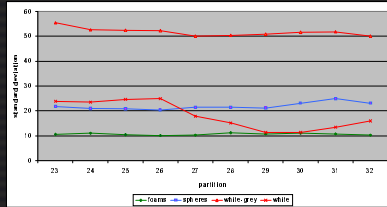
2. Interpretation of parameters

3D (mean grey level)



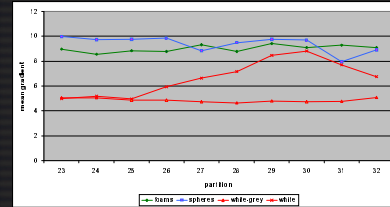
2. Interpretation of parameters

3D (standard deviation)



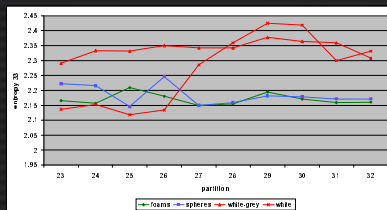
2. Interpretation of parameters

3D (mean gradient)



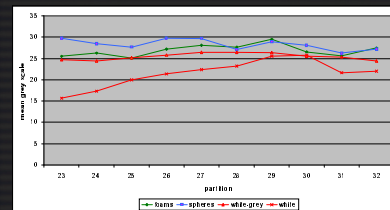
2. Interpretation of parameters

3D (entropy 3-3)



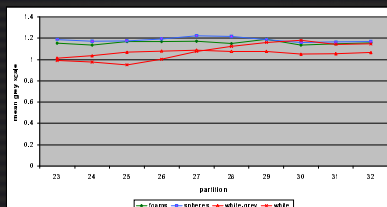
2. Interpretation of parameters

3D (sum of squares 3-3)



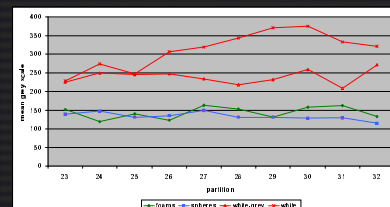
2. Interpretation of parameters

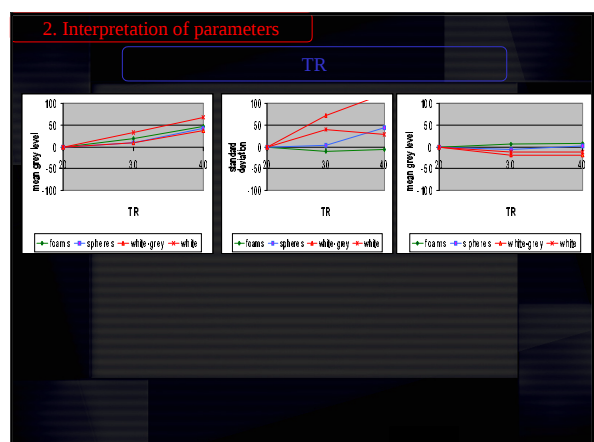
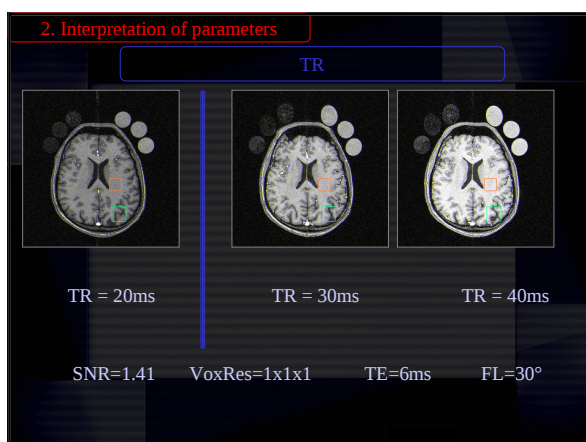
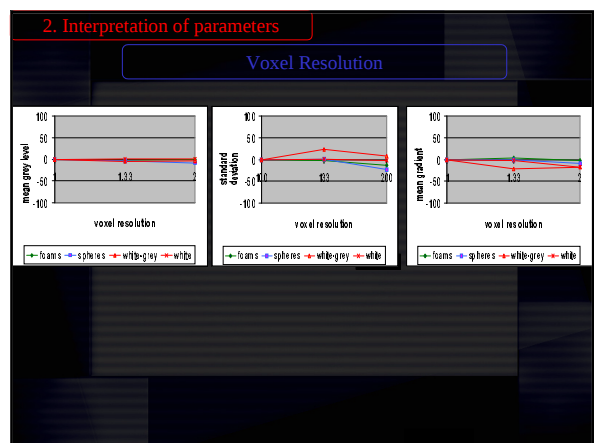
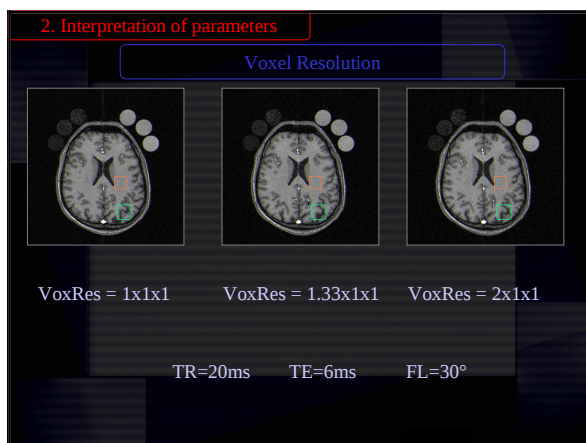
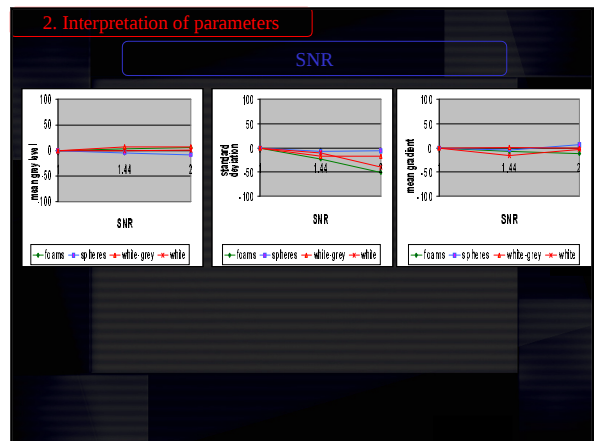
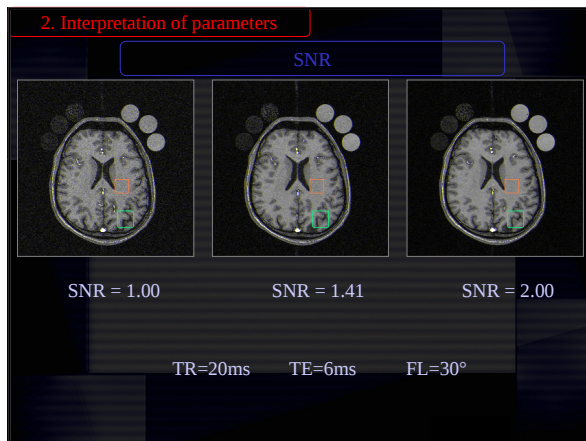
3D (diff. entropy 4-4)

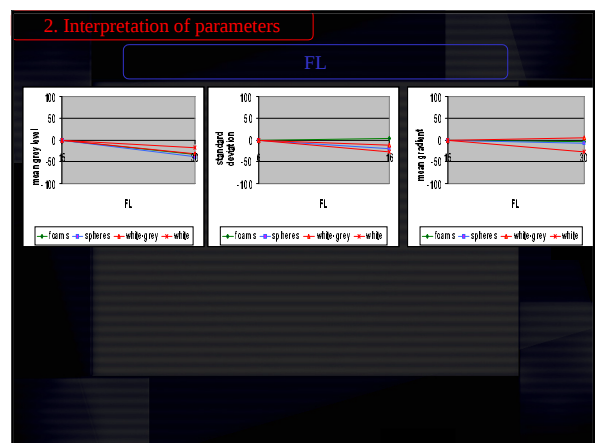
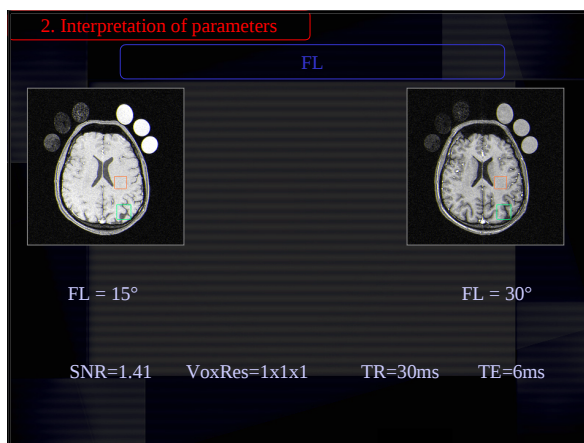
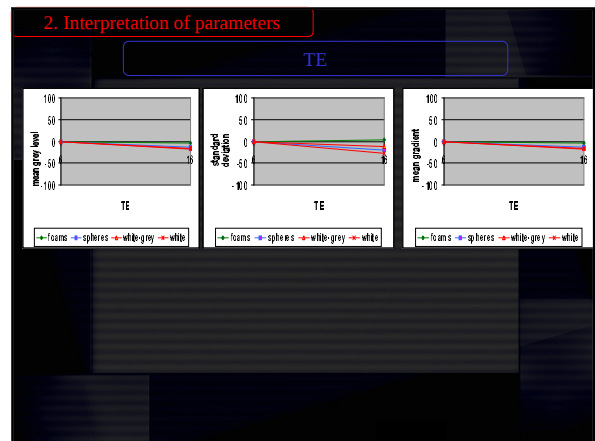
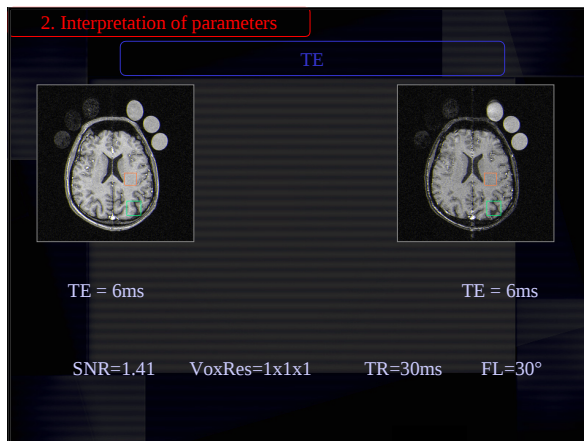


2. Interpretation of parameters

3D (horizontal run length)







3. Normalization

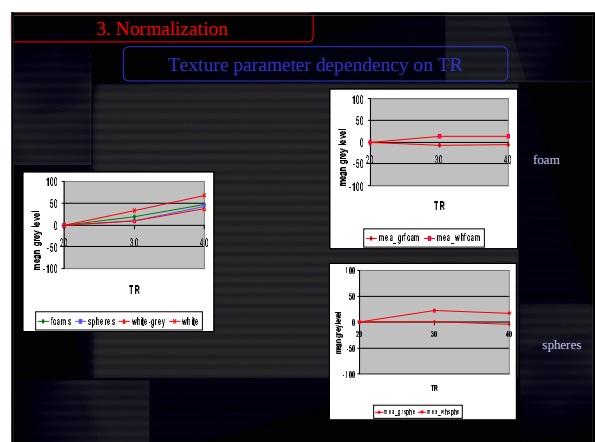
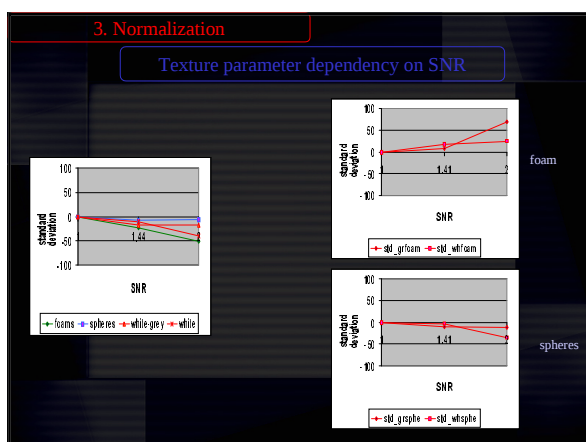
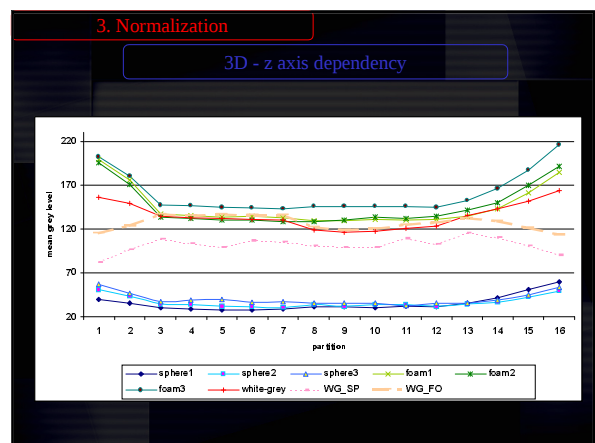
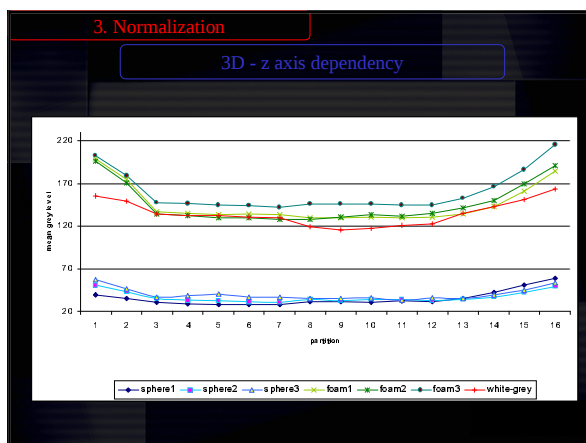
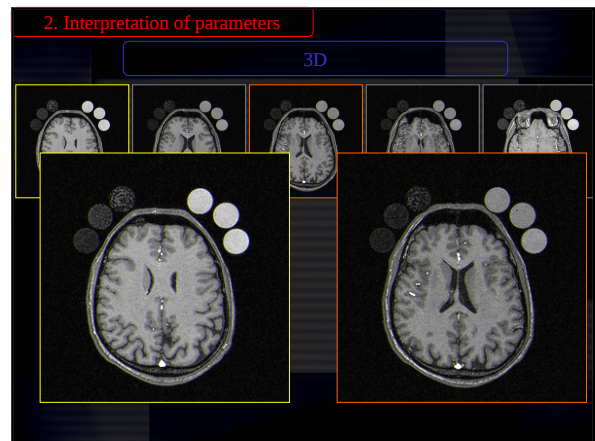
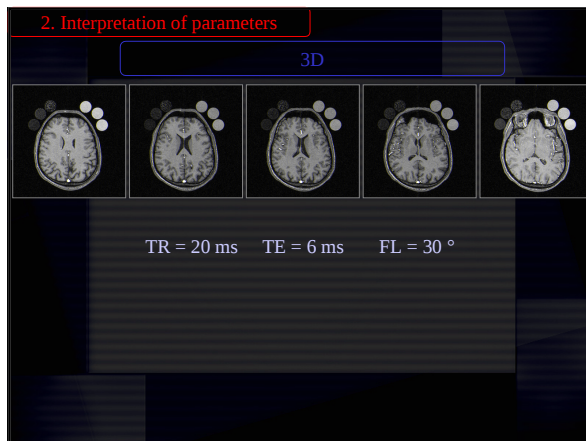
There is one problem in proceeding further with this research - it is the shortage of data. The method that we have adopted for this task is based on statistical analysis.

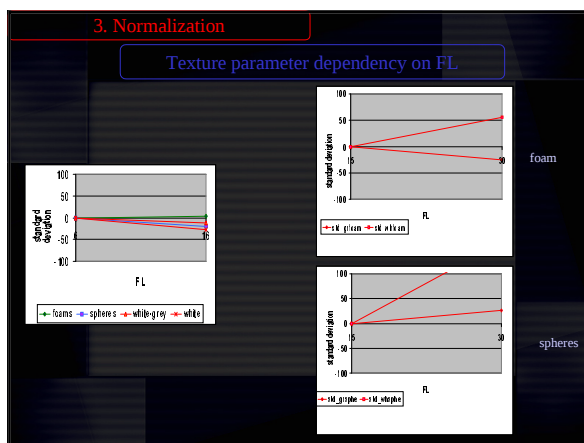
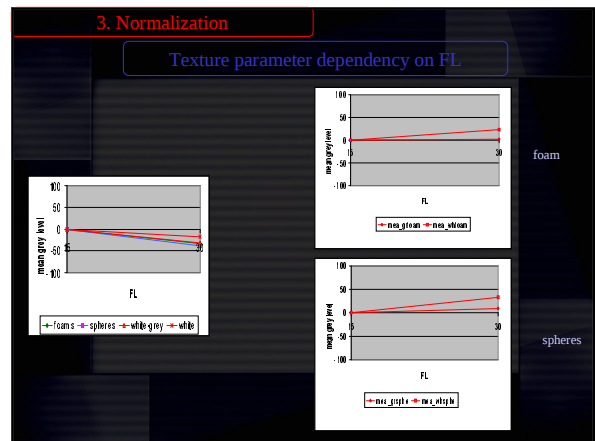
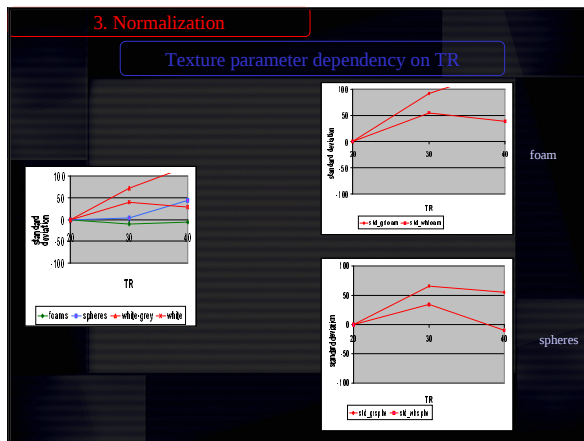
This means that to make any firm conclusion on expected relationship of texture parameters on noise or resolution, we have to have a large number of images at our disposal.

We do not know what is the "large number" in general; however, it is believed that 30 independent ROIs for each class (e.g. particular resolution and SNR) are sufficient in practice.

3. Normalization

- z axis dependency
- MR parameters dependency





4. Future work

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