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MUTANT: a new image filtering paradigm for improved parameters determination. Application to myelin water fraction mapping and sodium concentrations imaging

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► To cite this version:

J.-M. Bonny, Wafaa Zaaraoui, Mohamed-Mounir El Mendili, Guilhem Pagès, Mustapha Bouhrara. **MUTANT: a new image filtering paradigm for improved parameters determination. Application to myelin water fraction mapping and sodium concentrations imaging.** ISMRM workshop, Sep 2023, Nashville (Tennessee), United States. hal-04235727

HAL Id: hal-04235727

<https://hal.inrae.fr/hal-04235727>

Submitted on 10 Oct 2023

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Theory

- General framework for the nonlocal multispectral filtering, named **MUIT**ispectral qu**ANT**itative filtering = **MUTANT**
 - Nonlocal = filtered intensity in a voxel is a weighted mean of all other intensities within image
 - Weight $\mu(i, j)$ is proportional to the similarity between two voxels
- Similarity $\mu_k(i, j)$ between voxels i and j in the k -th frame derived from the Bayes theorem
 - μ_k can be calculated for any noise pdf = **Genericity**
 - The vector of framewise similarities $[\mu_1, \dots, \mu_K]^T$ carries all the information regarding the similarity between voxels i and j
- A fusion operator g used to combine the multispectral information
 - Pave the way for a myriad of context-dependent filters = **Flexibility**
 - E.g. $g = f$ -min / sensitive to the f frames indicating the lowest similarities

Results

- Gaussian pdf

- Rician pdf

