

## REFERENCES

---

- [1]. Web, Brain. "Simulated brain database." *McConnell Brain Imaging Centre, Montreal Neurological Institute, McGill*, <http://brainweb.bic.mni.mcgill.ca/brainweb> (2004).
- [2]. Nakamura, Yasuhiko, et al. "Magnetic resonance imaging of bone and soft-tissue tumors." *Hirosaki Igaku* 42.1 (1990): 51-60.
- [3]. Chalela, Julio A., et al. "Magnetic resonance imaging and computed tomography in emergency assessment of patients with suspected acute stroke: a prospective comparison." *The Lancet* 369.9558 (2007): 293-298.
- [4]. Wendt, Richard. "The Mathematics of Medical Imaging: A Beginner's Guide." (2010): 1987-1987.
- [5]. Shung, K. Kirk, Michael Smith, and Benjamin MW Tsui. *Principles of medical imaging*. Academic Press, 2012.
- [6]. Marcus, Daniel S., et al. "Open Access Series of Imaging Studies (OASIS): cross-sectional MRI data in young, middle aged, nondemented, and demented older adults." *Journal of cognitive neuroscience* 19.9 (2007): 1498-1507.
- [7]. Menze, B., et al. "Multimodal brain tumor segmentation challenge." *MICCAI Conference*. 2012.
- [8]. Milanfar, Peyman. "A tour of modern image filtering: New insights and methods, both practical and theoretical." *IEEE Signal Processing Magazine* 30.1 (2013): 106-128.
- [9]. Aja-Fernández, Santiago, and Antonio Tristán-Vega. "A review on statistical noise models for magnetic resonance imaging." *LPI, ETSI Telecomunicacion, Universidad de Valladolid, Spain, Tech. Rep* (2013).
- [10]. Gudbjartsson, Hákon, and Samuel Patz. "The Rician distribution of noisy MRI data." *Magnetic resonance in medicine* 34.6 (1995): 910-914.
- [11]. McVeigh, E. R., R. M. Henkelman, and M. J. Bronskill. "Noise and filtration in magnetic resonance imaging." *Medical Physics* 12.5 (1985): 586-591.
- [12]. Gravel, Pierre, Gilles Beaudoin, and Jacques A. De Guise. "A method for modeling noise in medical images." *IEEE Transactions on medical imaging* 23.10 (2004): 1221-1232.

- [13]. Maitra, Ranjan, and David Faden. "Noise estimation in magnitude MR datasets." *IEEE transactions on medical imaging* 28.10 (2009): 1615-1622.
- [14]. Coupé, Pierrick, et al. "Robust Rician noise estimation for MR images." *Medical image analysis* 14.4 (2010): 483-493.
- [15]. Manjón, José V., Pierrick Coupé, and Antonio Buades. "MRI noise estimation and denoising using non-local PCA." *Medical image analysis* 22.1 (2015): 35-47.
- [16]. Gerig, Guido, et al. "Nonlinear anisotropic filtering of MRI data." *IEEE Transactions on medical imaging* 11.2 (1992): 221-232.
- [17]. McInerney, Tim, and Demetri Terzopoulos. "Deformable models in medical image analysis: a survey." *Medical image analysis* 1.2 (1996): 91-108.
- [18]. Sijbers, Jan, et al. "Maximum-likelihood estimation of Rician distribution parameters." *IEEE Transactions on Medical Imaging* 17.3 (1998): 357-361.
- [19]. Manjón, José V., et al. "MRI denoising using non-local means." *Medical image analysis* 12.4 (2008): 514-523.
- [20]. Taki, Yasuyuki, et al. "Correlations among brain gray matter volumes, age, gender, and hemisphere in healthy individuals." *PLoS One* 6.7 (2011): e22734.
- [21]. Mohan, J., V. Krishnaveni, and Yanhui Guo. "A survey on the magnetic resonance image denoising methods." *Biomedical Signal Processing and Control* 9 (2014): 56-69.
- [22]. Somkantha, Krit, Nipon Theera-Umpon, and Sansanee Auephanwiriyaikul. "Boundary detection in medical images using edge following algorithm based on intensity gradient and texture gradient features." *IEEE transactions on biomedical engineering* 58.3 (2011): 567-573.
- [23]. Canny, John. "A computational approach to edge detection." *IEEE Transactions on pattern analysis and machine intelligence* 6 (1986): 679-698.
- [24]. Vese, Luminita A., and Tony F. Chan. "A multiphase level set framework for image segmentation using the Mumford and Shah model." *International journal of computer vision* 50.3 (2002): 271-293.
- [25]. Foi, Alessandro. "Noise estimation and removal in MR imaging: the variance-stabilization approach." *Biomedical Imaging: From Nano to Macro, 2011 IEEE International Symposium on*. IEEE, 2011.

- [26]. Van Leemput, Koen, et al. "Automated model-based bias field correction of MR images of the brain." *IEEE transactions on medical imaging* 18.10 (1999): 885-896.
- [27]. Banerjee, Abhirup, and Pradipta Maji. "Rough sets for bias field correction in MR images using contraharmonic mean and quantitative index." *IEEE transactions on medical imaging* 32.11 (2013): 2140-2151.
- [28]. Mukherjee, Partha Sarathi, and Peihua Qiu. "Efficient bias correction for magnetic resonance image denoising." *Statistics in medicine* 32.12 (2013): 2079-2096.
- [29]. Wang, Shanshan, et al. "Bias correction for magnetic resonance images via joint entropy regularization." *Bio-medical materials and engineering* 24.1 (2014): 1239-1245.
- [30]. G. Wright, Magnetic resonance imaging, *IEEE Signal Process. Mag.* 14 (1997) 56-66.
- [31]. Rodriguez, A. O. "Principles of magnetic resonance imaging." *Revista mexicana de física* 50.3 (2004): 272-286.
- [32]. Henkelman, R. Mark. "Erratum: Measurement of signal intensities in the presence of noise in MR images [Med. Phys. 12, 232 (1985)]." *Medical physics* 13.4 (1986): 544-544.
- [33]. Gudbjartsson, Hákon, and Samuel Patz. "The Rician distribution of noisy MRI data." *Magnetic resonance in medicine* 34.6 (1995): 910-914.
- [34]. Dietrich, Olaf, et al. "Measurement of signal-to-noise ratios in MR images: Influence of multichannel coils, parallel imaging, and reconstruction filters." *Journal of Magnetic Resonance Imaging* 26.2 (2007): 375-385.
- [35]. Dietrich, Olaf, et al. "Influence of multichannel combination, parallel imaging and other reconstruction techniques on MRI noise characteristics." *Magnetic resonance imaging* 26.6 (2008): 754-762.
- [36]. Thunberg, Per, and Per Zetterberg. "Noise distribution in SENSE-and GRAPPA-reconstructed images: a computer simulation study." *Magnetic resonance imaging* 25.7 (2007): 1089-1094.
- [37]. Perona, Pietro, and Jitendra Malik. "Scale-space and edge detection using anisotropic diffusion." *IEEE Transactions on pattern analysis and machine intelligence* 12.7 (1990): 629-639.

- [38]. Samsonov, Alexei A., and Chris R. Johnson. "Noise-adaptive nonlinear diffusion filtering of MR images with spatially varying noise levels." *Magnetic Resonance in Medicine* 52.4 (2004): 798-806.
- [39]. Buades, Antoni, Bartomeu Coll, and Jean-Michel Morel. "A review of image denoising algorithms, with a new one." *Multiscale Modeling & Simulation* 4.2 (2005): 490-530.
- [40]. Manjón, José V., et al. "Adaptive non-local means denoising of MR images with spatially varying noise levels." *Journal of Magnetic Resonance Imaging* 31.1 (2010): 192-203.
- [41]. Tomasi, Carlo, and Roberto Manduchi. "Bilateral filtering for gray and color images." *Computer Vision, 1998. Sixth International Conference on*. IEEE, 1998.
- [42]. Wong, Wilbur CK, and Albert CS Chung. "A nonlinear and non-iterative noise reduction technique for medical images: concept and methods comparison." *International Congress Series*. Vol. 1268. Elsevier, 2004.
- [43]. Mohl, B., M. Wahlberg, and P. T. Madsen. "Ideal spatial adaptation via wavelet shrinkage." *The Journal of the Acoustical Society of America* 114 (2003): 1143-1154.
- [44]. Delakis, Ioannis, Omer Hammad, and Richard I. Kitney. "Wavelet-based denoising algorithm for images acquired with parallel magnetic resonance imaging (MRI)." *Physics in Medicine and biology* 52.13 (2007): 3741.
- [45]. Candès, Emmanuel J., and David L. Donoho. "Curvelets and curvilinear integrals." *Journal of Approximation Theory* 113.1 (2001): 59-90.
- [46]. Ma, Jianwei, and Gerlind Plonka. "Combined curvelet shrinkage and nonlinear anisotropic diffusion." *IEEE Transactions on Image Processing* 16.9 (2007): 2198-2206.
- [47]. Sijbers, Jan, et al. "Estimation of the noise in magnitude MR images." *Magnetic Resonance Imaging* 16.1 (1998): 87-90.
- [48]. Rajan, Jeny, et al. "Nonlocal maximum likelihood estimation method for denoising multiple-coil magnetic resonance images." *Magnetic Resonance Imaging* 30.10 (2012): 1512-1518.
- [49]. Aja-Fernández, Santiago, Carlos Alberola-López, and Carl-Fredrik Westin. "Noise and signal estimation in magnitude MRI and Rician distributed images: a LMMSE approach." *IEEE transactions on image processing* 17.8 (2008): 1383-1398.

- [50]. Golshan, Hosein M., Reza PR Hasanzadeh, and Shahrokh C. Yousefzadeh. "An MRI denoising method using image data redundancy and local SNR estimation." *Magnetic resonance imaging* 31.7 (2013): 1206-1217.
- [51]. Awate, Suyash P., and Ross T. Whitaker. "Feature-preserving MRI denoising: a nonparametric empirical Bayes approach." *IEEE Transactions on Medical Imaging* 26.9 (2007): 1242-1255.
- [52]. Coupé, Pierrick, et al. "Robust Rician noise estimation for MR images." *Medical image analysis* 14.4 (2010): 483-493.
- [53]. Luo, Jianhua, Yuemin Zhu, and Isabelle E. Magnin. "Denoising by averaging reconstructed images: application to magnetic resonance images." *IEEE transactions on biomedical engineering* 56.3 (2009): 666-674.
- [54]. Luo, Jianhua, Yuemin Zhu, and Bassem Hiba. "Medical image denoising using one-dimensional singularity function model." *Computerized Medical Imaging and Graphics* 34.2 (2010): 167-176.
- [55]. Redpath, T. W. "Signal-to-noise ratio in MRI." *The British Journal of Radiology* 71.847 (1998): 704-707.
- [56]. Zhu, Hongtu, et al. "Regression models for identifying noise sources in magnetic resonance images." *Journal of the American Statistical Association* 104.486 (2009): 623-637.
- [57]. Macovski, Albert. "Noise in MRI." *Magnetic Resonance in Medicine* 36.3 (1996): 494-497.
- [58]. Constantinides, Chris D., Ergin Atalar, and Elliot R. McVeigh. "Signal-to-noise measurements in magnitude images from NMR phased arrays." *Magnetic Resonance in Medicine* 38.5 (1997): 852-857.
- [59]. McVeigh, E. R., R. M. Henkelman, and M. J. Bronskill. "Noise and filtration in magnetic resonance imaging." *Medical Physics* 12.5 (1985): 586-591.
- [60]. Gerig, Guido, et al. "Nonlinear anisotropic filtering of MRI data." *IEEE Transactions on medical imaging* 11.2 (1992): 221-232.
- [61]. Walker, Scott A., David Miller, and Jody Tanabe. "Bilateral spatial filtering: Refining methods for localizing brain activation in the presence of parenchymal abnormalities." *NeuroImage* 33.2 (2006): 564-569.
- [62]. Xie, Jun, Pheng-Ann Heng, and Mubarak Shah. "Image diffusion using saliency bilateral filter." *IEEE Transactions on Information Technology in Biomedicine* 12.6 (2008): 768-771.

- [63]. Hamarneh, Ghassan, and Judith Hradsky. "Bilateral filtering of diffusion tensor magnetic resonance images." *IEEE Transactions on Image Processing* 16.10 (2007): 2463-2475.
- [64]. Wong, Wilbur CK, and Albert CS Chung. "A nonlinear and non-iterative noise reduction technique for medical images: concept and methods comparison." *International Congress Series*. Vol. 1268. Elsevier, 2004.
- [65]. Donoho, David L. "De-noising by soft-thresholding." *IEEE transactions on information theory* 41.3 (1995): 613-627.
- [66]. Weaver, JOHN B., et al. "Filtering noise from images with wavelet transforms." *Magnetic Resonance in Medicine* 21.2 (1991): 288-295.
- [67]. Wink, Alle Meije, and Jos BTM Roerdink. "Denoising functional MR images: a comparison of wavelet denoising and Gaussian smoothing." *IEEE transactions on medical imaging* 23.3 (2004): 374-387.
- [68]. Starck, Jean-Luc, Emmanuel J. Candès, and David L. Donoho. "The curvelet transform for image denoising." *IEEE Transactions on image processing* 11.6 (2002): 670-684.
- [69]. Do, Minh N., and Martin Vetterli. "The contourlet transform: an efficient directional multiresolution image representation." *IEEE Transactions on image processing* 14.12 (2005): 2091-2106.
- [70]. Parthiban, Latha, and R. Subramanian. "Medical image denoising using X-lets." *India Conference, 2006 Annual IEEE*. IEEE, 2006.
- [71]. McGibney, G., and M. R. Smith. "An unbiased signal-to-noise ratio measure for magnetic resonance images." *Medical physics* 20.4 (1993): 1077-1078.
- [72]. Sijbers, Jan, and A. J. Den Dekker. "Maximum likelihood estimation of signal amplitude and noise variance from MR data." *Magnetic Resonance in Medicine* 51.3 (2004): 586-594.
- [73]. Jiang, Lei, and Wenhui Yang. "Adaptive Magnetic Resonance Image Denoising Using Mixture Model and Wavelet Shrinkage." *DICTA*. 2003.
- [74]. Sijbers, Jan, et al. "Automatic estimation of the noise variance from the histogram of a magnetic resonance image." *Physics in medicine and biology* 52.5 (2007): 1335.
- [75]. He, Lili, and Ian R. Greenshields. "A nonlocal maximum likelihood estimation method for Rician noise reduction in MR images." *IEEE transactions on medical imaging* 28.2 (2009): 165-172.

- [76]. Rajan, Jeny, et al. "Noise measurement from magnitude MRI using local estimates of variance and skewness." *Physics in medicine and biology* 55.16 (2010): N441.
- [77]. Rajan, Jeny, et al. "Maximum likelihood estimation-based denoising of magnetic resonance images using restricted local neighborhoods." *Physics in medicine and biology* 56.16 (2011): 5221.
- [78]. Aja-Fernández, Santiago, et al. "Restoration of DWI data using a Rician LMMSE estimator." *IEEE transactions on medical imaging* 27.10 (2008): 1389-1403.
- [79]. Golshan, Hosein M., and Reza PR Hasanzadeh. "A non-local Rician noise reduction approach for 3-D magnitude magnetic resonance images." *Machine Vision and Image Processing (MVIP), 2011 7th Iranian*. IEEE, 2011.
- [80]. Awate, Suyash P., and Ross T. Whitaker. "Feature-preserving MRI denoising: a nonparametric empirical Bayes approach." *IEEE Transactions on Medical Imaging* 26.9 (2007): 1242-1255.
- [81]. Jain, Anil K. *Fundamentals of digital image processing*. Prentice-Hall, Inc., 1989.
- [82]. Salinas, Harry M., and Delia Cabrera Fernández. "Comparison of PDE-based nonlinear diffusion approaches for image enhancement and denoising in optical coherence tomography." *IEEE Transactions on Medical Imaging* 26.6 (2007): 761-771.
- [83]. Wang, Zhou, et al. "Image quality assessment: from error visibility to structural similarity." *IEEE transactions on image processing* 13.4 (2004): 600-612.
- [84]. Gonzalez, R. C., R. E. Woods, and S. L. Eddins. "Representation and description." *Digital Image Processing* (1992): 518-528.
- [85]. Gilboa, Guy, Nir Sochen, and Yehoshua Y. Zeevi. "Image enhancement and denoising by complex diffusion processes." *IEEE transactions on pattern analysis and machine intelligence* 26.8 (2004): 1020-1036.
- [86]. Aja-Fernández, Santiago, Carlos Alberola-López, and Carl-Fredrik Westin. "Noise and signal estimation in magnitude MRI and Rician distributed images: a LMMSE approach." *IEEE transactions on image processing* 17.8 (2008): 1383-1398.
- [87]. Ashburner, John, and Karl J. Friston. "Voxel-based morphometry—the methods." *Neuroimage* 11.6 (2000): 805-821.

- [88]. McVeigh, E. R., R. M. Henkelman, and M. J. Bronskill. "Noise and filtration in magnetic resonance imaging." *Medical Physics* 12.5 (1985): 586-591.
- [89]. Yang, Guang-Zhong, et al. "Structure adaptive anisotropic filtering for magnetic resonance image enhancement." *International Conference on Computer Analysis of Images and Patterns*. Springer, Berlin, Heidelberg, 1995.
- [90]. Krissian, Karl, and Santiago Aja-Fernández. "Noise-driven anisotropic diffusion filtering of MRI." *IEEE transactions on image processing* 18.10 (2009): 2265-2274.
- [91]. You, Y-L., and Mostafa Kaveh. "Fourth-order partial differential equations for noise removal." *IEEE Transactions on Image Processing* 9.10 (2000): 1723-1730.
- [92]. Rajan, Jeny, et al. "Denoising magnetic resonance images using fourth order complex diffusion." *Machine Vision and Image Processing Conference, 2009. IMVIP'09. 13th International*. IEEE, 2009.
- [93]. Coupé, Pierrick, Pierre Yger, and Christian Barillot. "Fast non local means denoising for 3D MR images." *Medical Image Computing and Computer-Assisted Intervention—MICCAI 2006* (2006): 33-40.
- [94]. Gal, Yaniv, et al. "Denoising of dynamic contrast-enhanced MR images using dynamic nonlocal means." *IEEE transactions on medical imaging* 29.2 (2010): 302-310.
- [95]. Candés, E. J., and D. L. Donoho. "Curvelets." *Manuscript*. <http://www-stat.stanford.edu/~donoho/Reports/1999/curvelets.pdf> (1999).
- [96]. Nowak, Robert D. "Wavelet-based Rician noise removal for magnetic resonance imaging." *IEEE Transactions on Image Processing* 8.10 (1999): 1408-1419.
- [97]. Bao, Paul, and Lei Zhang. "Noise reduction for magnetic resonance images via adaptive multiscale products thresholding." *IEEE transactions on medical imaging* 22.9 (2003): 1089-1099.
- [98]. Tan, Lina, and Liangwu Shi. "Multiwavelet-based estimation for improving magnetic resonance images." *Image and Signal Processing, 2009. CISP'09. 2nd International Congress on*. IEEE, 2009.
- [99]. Anand, C. Shyam, and J. S. Sahambi. "MRI denoising using bilateral filter in redundant wavelet domain." *TENCON 2008-2008 IEEE Region 10 Conference*. IEEE, 2008.

- [100]. Bloch, Isabelle. "Lattices of fuzzy sets and bipolar fuzzy sets, and mathematical morphology." *Information Sciences* 181.10 (2011): 2002-2015.
- [101]. Hamid, Mahmoud S., Neal R. Harvey, and Stephen Marshall. "Genetic algorithm optimization of multidimensional grayscale soft morphological filters with applications in film archive restoration." *IEEE Transactions on Circuits and Systems for Video Technology* 13.5 (2003): 406-416.
- [102]. Hussain, Ayyaz, Sohail Masood Bhatti, and M. Arfan Jaffar. "Fuzzy based impulse noise reduction method." *Multimedia Tools and Applications* 60.3 (2012): 551-571.
- [103]. Hussain, Ayyaz, M. Arfan Jaffar, and Anwar M. Mirza. "A hybrid image restoration approach: fuzzy logic and directional weighted median based uniform impulse noise removal." *Knowledge and Information Systems* 24.1 (2010): 77-90.
- [104]. Van De Ville, Dimitri, et al. "Noise reduction by fuzzy image filtering." *IEEE transactions on fuzzy systems* 11.4 (2003): 429-436.
- [105]. Sharif, Muhammad, Muhammad Arfan Jaffar, and Muhammad Tariq Mahmood. "Rician noise reduction by combining mathematical morphological operators through genetic programming." *Optical review* 20.4 (2013): 289-292.
- [106]. Manjón, José V., et al. "MRI denoising using non-local means." *Medical image analysis* 12.4 (2008): 514-523.
- [107]. Muresan, D. Darian, and Thomas W. Parks. "Adaptive principal components and Image denoising." *Image Processing, 2003. ICIP 2003. Proceedings. 2003 International Conference on*. Vol. 1. IEEE, 2003.
- [108]. Abramowitz, Milton, and Irene A. Stegun. *Handbook of mathematical functions: with formulas, graphs, and mathematical tables*. Vol. 55. Courier Corporation, 1964.

- [109]. Vetterling, William T., Saul A. Teukolsky, and William H. Press. *Numerical recipes: example book (C)*. Press Syndicate of the University of Cambridge, 1992.
- [110]. Lim, Jae S. "Two-dimensional signal and image processing." *Englewood Cliffs, NJ, Prentice Hall, 1990, 710 p.* (1990).
- [111]. Dabov, Kostadin, et al. "Image denoising by sparse 3-D transform-domain collaborative filtering." *IEEE Transactions on image processing* 16.8 (2007): 2080-2095.
- [112]. Srivastava, Rajeev, and Subodh Srivastava. "Restoration of Poisson noise corrupted digital images with nonlinear PDE based filters along with the choice of regularization parameter estimation." *Pattern Recognition Letters* 34.10 (2013): 1175-1185.
- [113]. Basu, Saurav, Thomas Fletcher, and Ross Whitaker. "Rician noise removal in diffusion tensor MRI." *Medical Image Computing and Computer-Assisted Intervention–MICCAI 2006* (2006): 117-125.
- [114]. Yadav, R. B., Subodh Srivastava, and Rajeev Srivastava. "Modified complex diffusion based nonlinear filter for restoration and enhancement of magnetic resonance images." *International Journal of Biomedical Engineering and Technology* 23.1 (2017): 19-37.
- [115]. Perona, Pietro. "Orientation diffusions." *IEEE Transactions on Image processing* 7.3 (1998): 457-467.
- [116]. Nie, Yao, and Kenneth E. Barner. "The fuzzy transformation and its applications in image processing." *IEEE Transactions on Image processing* 15.4 (2006): 910-927.

- [117]. Srivastava, Rajeev, and J. R. P. Gupta. "A PDE-based nonlinear filter adapted to Rayleigh's speckle noise for de-speckling 2D ultrasound images." *International Conference on Contemporary Computing*. Springer, Berlin, Heidelberg, 2010.
- [118]. Rudin, Leonid I., Stanley Osher, and Emad Fatemi. "Nonlinear total variation based noise removal algorithms." *Physica D: Nonlinear Phenomena* 60.1-4 (1992): 259-268.
- [119]. Gilboa, Guy, Nir Sochen, and Yehoshua Y. Zeevi. "Image enhancement and Denoising by complex diffusion processes." *IEEE transactions on pattern analysis and machine intelligence* 26.8 (2004): 1020-1036.
- [120]. Phophalia, Ashish. "Techniques for Denoising Brain Magnetic Resonance Images." (2016).