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Theses And Dissertations

- Nitzken, M. “Shape Analysis of the Human Brain”. Doctorate of Philosophy, Electrical and Computer Engineering. University of Louisville, May 2015.
- Nitzken, M. “Shape-based detection of cortex variability for more accurate discrimination between autistic and normal brains”. ISBN-13: 9781124393353, ISBN: 1124393358. Bachelor of Science, Bioengineering. University of Louisville, Aug. 2010.
- Nitzken, M. “Diagnosis of Kidney Transplant Success Using Image Segmentation And Intensity Analysis Techniques”. Masters of Engineering, Bioengineering. University of Louisville, May 2009.

Patents

- Nitzken, M and A S El-Baz. “Computer aided diagnostic system incorporating shape analysis for diagnosing malignant lung nodules”. 9230320. US Patent 9,230,320. Jan. 2016.
- Nitzken, M, A S El-Baz, and M F Casanova. “Computer aided diagnostic system incorporating 3D shape analysis of the brain for identifying developmental brain disorders”. 9230321. US Patent 9,230,321. Jan. 2016.
- Nitzken, M, A El-Baz, A Alansary, A Soliman, and M Casanova. “Brain Segmentation Method for Young Children and Adults”. English. Provisional -. 2014.
- Nitzken, M, A El-Baz, and G. Beache. “Improved Spatial-Spectral Analysis by Augmented Modeling of 3D Image Appearance Characteristics with Application to Radio Frequency Tagged Cardiovascular Magnetic Resonance (CMR)”. English. Non Provisional 61-617,871. 2014.
- Nitzken, M, A El-Baz, N. Bajaj, and A. Ovechkin. “Localized ECG Removal from EMG Signals Using Wavelet Analysis”. English. Disclosure disclosure. 2013.

Software Copyrights

- Nitzken, M and A El-Baz. *3D Image Enhancement for Improvements in Spectral Tracking (No. TX 7-546-226)*. Software Copyright. 2014.
- Nitzken, M and A El-Baz. *Shape Analysis for Early Diagnosis of Autism and Lung Cancer (No. TX 7-520-124)*. Software Copyright. 2013.

Articles In Peer-Reviewed Journals

- Alansary, A, M Ismail, A Soliman, F Khalifa, M Nitzken, A Elnakib, M Mostapha, A Black, K Stinebruner, and M F Casanova. “Infant Brain Extraction in T1-weighted MR Images using BET and Refinement using LCDG and MGRF Models”. In: *IEEE Journal Of Biomedical And Health Informatics* 20.3 (2016), pp. 925–935.
- Nitzken, M, G M Beache, M Ismail, G Gimel’farb, and A El-Baz. “Improving full-cardiac cycle strain estimation from tagged CMR by accurate modeling of 3D image appearance characteristics”. In: *The Egyptian Journal of Radiology and Nuclear Medicine* 47.1 (2016), pp. 83–94.
- Dombroski, Brynn A, M J Nitzken, A A Elnakib, F Khalifa, A E Switala, A S El-Baz, and M F Casanova. “Cortical surface complexity in a population-based normative sample”. In: *Translational Neuroscience* 5.1 (2014), pp. 17–24.
- Elnakib, A, A Soliman, M Nitzken, M F Casanova, G Gimel’farb, and A El-Baz. “Magnetic Resonance Imaging Findings for Dyslexia: A Review”. In: *Journal of Biomedical Nanotechnology* 10.10 (2014), pp. 2778–2805.
- Nitzken, M J, M F Casanova, G Gimelfarb, T Inanc, J M Zurada, and A El-Baz. “Shape analysis of the human brain: a brief survey.” In: *IEEE journal of biomedical and health informatics* 18.4 (2014), pp. 1337–1354.
- Alansary, A, A Soliman, F Khalifa, A Elnakib, M Mostapha, M Nitzken, M Casanova, and A El-Baz. “MAP-based framework for segmentation of MR brain images based on visual appearance and prior shape”. In: *MIDAS J* 1 (2013), p. 1.

- Nitzken, M, N Bajaj, S Aslan, G Gimel'farb, A El-Baz, and A Ovechkin. "Local wavelet-based filtering of electromyographic signals to eliminate the electrocardiographic-induced artifacts in patients with spinal cord injury". In: *Journal of biomedical science and engineering* 6.7B (2013), pp. 1–10.
- Nitzken, M J, A S El-Baz, and G M Beache. "Markov-Gibbs Random Field Model for Improved Full-Cardiac Cycle Strain Estimation from Tagged CMR". In: *Journal of Cardiovascular Magnetic Resonance* 14.1 (2012), pp. 1–2.
- Williams, E L, A El-Baz, M Nitzken, A E Switala, and M F Casanova. "Spherical harmonic analysis of cortical complexity in autism and dyslexia". In: *Translational neuroscience* 3.1 (2012), pp. 36–40.
- El-Baz, A, M Nitzken, G Gimel'farb, E Van Bogaert, R Falk, M A El-Ghar, and J Suri. "Three-dimensional shape analysis using spherical harmonics for early assessment of detected lung nodules". In: *Lung Imaging and Computer Aided Diagnosis* 19 (2011), pp. 421–438.
- Kondapaneni, M, M Nitzken, E Bogaert, G Gimel'farb, R Falk, M Au El-Ghar, and A El-Baz. "A novel shape-based diagnostic approach for early diagnosis of lung nodules". In: *CHEST Journal* 140.4_MeetingAbstracts (2011), 655A–655A.

Books

- El-Baz, A, M Nitzken, G Gimel'Farb, E. Van Bogaert, R. Falk, M Abo El-Ghar, and J. Suri. "3D Shape Analysis Using Spherical Harmonics for Early Assessment of Detected Lung Nodules". In: *Handbook of Lung Imaging and Computer Aided Diagnosis*. Ed. by A. El-Baz and J. Suri. Vol. 1. 1. United Kingdom: Taylor & Francis, Oct. 2011. Chap. 19. ISBN: 978-1-4398-4557-8.
- Nitzken, M, M F Casanova, F Khalifa, G Sokhadze, and A El-Baz. "Shape-Based Detection of Cortex Variability for More Accurate Discrimination Between Autistic and Normal Brains". In: *Handbook of Multi-Modality State-of-the-Art Medical Image Segmentation and Registration Methodologies*. Ed. by A. El-Baz, R. Acharya, A. Laine, and J. Suri. Vol. 2. New York: Springer Verlag, Mar. 2011. Chap. 7, pp. 161–185. ISBN: 978-1-4419-8203-2.

Peer-Reviewed Conference Proceedings

- Ismail, Marwa, Gregory Barnes, Matthew Nitzken, Andrew Switala, Ahmed Shalaby, Ehsan Hosseini-Asl, Manuel Casanova, Robert Keynton, Ashraf Khalil, and Ayman El-Baz. "A new deep-learning approach for early detection of shape variations in autism using structural mri". In: *Image Processing (ICIP), 2017 IEEE International Conference on*. IEEE. 2017, pp. 1057–1061.
- Ismail, M, M Mostapha, A Soliman, M Nitzken, F Khalifa, A Elnakib, G Gimel'farb, MF Casanova, and A El-Baz. "Segmentation of infant brain MR images based on adaptive shape prior and higher-order MGRF". In: *Image Processing (ICIP), 2015 IEEE International Conference on*. IEEE. 2015, pp. 4327–4331.
- Alansary, A, A Soliman, M Nitzken, F Khalifa, A Elnakib, M Mostapha, MF Casanova, and A El-Baz. "An integrated geometrical and stochastic approach for accurate infant brain extraction". In: *Image Processing (ICIP), 2014 IEEE International Conference on*. IEEE. Paris, France, Oct. 2014, pp. 3542–3546.
- Mostapha, M, A Alansary, A Soliman, F Khalifa, M Nitzken, R Khodeir, M F Casanova, and A El-Baz. "Atlas-based approach for the segmentation of infant DTI MR brain images". In: *Biomedical Imaging (ISBI), 2014 IEEE 11th International Symposium on*. IEEE. Beijing, China, Apr. 2014, pp. 1255–1258.
- Mostapha, M, A Soliman, F Khalifa, A Elnakib, A Alansary, M Nitzken, M Casanova, and El. "A Statistical Framework For The Classification of Infant DT Images". In: *Image Processing (ICIP), 2014 IEEE International Conference on*. IEEE. Paris, France, Oct. 2014.
- Nitzken, M J, M F Casanova, and A El-Baz. "SPHARM Analysis of the Brain Cortex for Diagnosing Dyslexia". In: *Biomedical Imaging (ISBI), 2014 IEEE 11th International Symposium on*. IEEE. Beijing, China, Apr. 2014.
- El-Baz, A, F Khalifa, A Elnakib, M Nitzken, A Soliman, Patrick McClure, M Au El-Ghar, and G Gimel'Farb. "A novel approach for global lung registration using 3D Markov-Gibbs appearance model". In: *Medical Image Computing and Computer-Assisted Intervention–MICCAI 2012*. IEEE. Nice, France: Springer, Oct. 2012, pp. 114–121.
- Casanova, M F, M Nitzken, E L Williams, A E Switala, and A El-Baz. "A Cerebral Spectrum From Autism to Dyslexia: Determining Cortical Surface Complexity Utilizing Spherical Harmonics". In: *IMFAR Program Booklet & Abstracts*. IMFAR. Toronto, Canada, May 2012.
- Elnakib, A, M Nitzken, MF Casanova, H Park, G Gimel'farb, and A El-Baz. "Quantification of age-related brain cortex change using 3D shape analysis". In: *Pattern Recognition (ICPR), 2012 21st International Conference on*. IEEE. Tsukuba, Japan, Nov. 2012, pp. 41–44.

- Nitzken, M, G Beache, A Elnakib, F Khalifa, G Gimel'farb, and A El-Baz. "Accurate modeling of tagged CMR 3D image appearance characteristics to improve cardiac cycle strain estimation". In: *Image Processing (ICIP), 2012 19th IEEE International Conference on*. IEEE. Orlando, Florida, USA, Sept. 2012, pp. 521–524.
- Nitzken, M, G Beache, A Elnakib, F Khalifa, G Gimel'farb, and A El-Baz. "Improving full-cardiac cycle strain estimation from tagged CMR by accurate modeling of 3D image appearance characteristics". In: *Biomedical Imaging (ISBI), 2012 9th IEEE International Symposium on*. (Selected for oral presentation). IEEE. Barcelona, Spain, May 2012, pp. 462–465.
- El-Baz, A, M Nitzken, F Khalifa, A Elnakib, G Gimel'farb, R Falk, and M A El-Ghar. "3D shape analysis for early diagnosis of malignant lung nodules". In: *Information Processing in Medical Imaging*. (Selected for oral presentation. Oral acceptance rate is 5 percent and the overall acceptance rate is 10 percent). IEEE. Monastery Irsee, Germany: Springer, July 2011, pp. 772–783.
- El-Baz, A, M Nitzken, F Khalifa, A Elnakib, G Gimel'farb, R Falk, and M A El-Ghar. "3D shape analysis for early diagnosis of malignant lung nodules". In: *Medical Image Computing and Computer-Assisted Intervention–MICCAI 2011*. IEEE. Toronto, Canada, Sept. 2011, pp. 175–182.
- El-Baz, A, M Nitzken, E Vanbogaert, G Gimel'Farb, R Falk, and M Abo El-Ghar. "A novel shape-based diagnostic approach for early diagnosis of lung nodules". In: *Biomedical Imaging: From Nano to Macro, 2011 IEEE International Symposium on*. IEEE. Chicago Illinois, USA, Mar. 2011, pp. 137–140.
- Elnakib, A, G M Beache, M Nitzken, G Gimel'farb, and A El-Baz. "A new framework for automated identification of pathological tissues in contrast enhanced cardiac magnetic resonance images". In: *Biomedical Imaging: From Nano to Macro, 2011 IEEE International Symposium on*. IEEE. Chicago, Illinois, USA, Mar. 2011, pp. 1272–1275.
- Khalifa, F, G M Beache, M Nitzken, G Gimel'farb, G Giridharan, and A El-Baz. "Automatic analysis of left ventricle wall thickness using short-axis cine CMR images". In: *Biomedical Imaging: From Nano to Macro, 2011 IEEE International Symposium on*. IEEE. Chicago Illinois, USA, Mar. 2011, pp. 1306–1309.
- Nitzken, M, MF Casanova, G Gimel'farb, A Elnakib, F Khalifa, A Switala, and A El-Baz. "3D shape analysis of the brain cortex with application to dyslexia". In: *Image Processing (ICIP), 2011 18th IEEE International Conference on*. (Selected for oral presentation. Oral acceptance rate is 10 percent and the overall acceptance rate is 35 percent). IEEE. Brussels, Belgium, Sept. 2011, pp. 2657–2660.
- Nitzken, M, MF Casanova, G Gimel'farb, F Khalifa, A Elnakib, A E Switala, and A El-Baz. "3D shape analysis of the brain cortex with application to autism". In: *Biomedical Imaging: From Nano to Macro, 2011 IEEE International Symposium on*. IEEE. Chicago, Illinois, USA, Mar. 2011, pp. 1847–1850.