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Title: Applications of Emerging Medical Imaging Technologies

Research emphasis:

In vivo medical imaging technologies in cancer and neurological applications; Simultaneous PET-MRI imaging – attenuation correction, motion correction, processing, and quantitative association between imaging results and treatment outcomes; X-ray, tomosynthesis, and CT imaging; image processing; signal processing.

Application:

- Sarcoma
- Neuroimaging in dementia
- Breast cancer
- Imaging in radiation and surgical treatment planning

Collaboration potential:

- Technical expertise in PET, MRI, and X-ray imaging
- Technical consultation on rodent imaging at UNC Small Animal Imaging Center
- Biomedical image analysis, quantification, and interpretation
- High-performance computation

Selected publications:

1. S. A. Brooks, A. H. Khandani, J. R. Fielding, W. Lin, T. Sills, Y. Lee, A. Arreola, M. I. Milowsky, E. M. Wallen, M. E. Woods, A. B. Smith, M. E. Nielsen, J. S. Parker, D. S. Lalush, and W. K. Rathmell, "Alternate metabolic programs define regional variation of relevant biological features in renal cell carcinoma progression," *Clinical Cancer Research*, Jan 19, 2016. (PMID: 26787754)
2. M. R. Juttukonda, B. G. Mersereau, Y. Chen, Y. Su, B. G. Rubin, T. L. S. Benzinger, D. S. Lalush, and H. An, "MR-based attenuation correction for PET/MRI neurological studies with continuous-valued attenuation coefficients for bone through a conversion from R2* to CT-Hounsfield units," *Neuroimage*, vol. 12, pp. 160-168, 2015. (PMID 25776213)
3. Y. Chen, M. Juttukonda, Y. Su, T. Benzinger, B. G. Rubin, Y. Z. Lee, W. Lin, D. Shen, D. Lalush, and H. An, "Probabilistic air segmentation and sparse regression estimated pseudo CT for PET/MR attenuation correction," *Radiology*, vol. 275, pp. 562-569, 2015. (PMID 25521778)
4. Gonzales, B. G., and D. S. Lalush, "Eigenvector decomposition of full-spectrum X-ray computed tomography," *Physics in Medicine and Biology*, vol. 57, pp. 1309-1323, 2012.