NGHIA Q. NGUYEN

Publications

- **Journals**

1. **Nghia Q. Nguyen** and Richard W. Prager, "A spatial coherence approach to minimum mean-squared error beamforming," submitted to *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control,* Dec. 2020 (under revision).
2. Huiwen Xie, Hao Guo, Guangquan Zhou, **Nghia Q. Nguyen**, and Richard W. Prager "Improved pixel-based image quality with axial Wiener filter and SNR-Dependent coherence factor," to be submitted to *Ultrasonics,* Dec. 2020 (under revision).
3. Lucian Beer, Paula Martin-Gonzalez, Maria Delgado-Ortet, Marika Reinius, Leonardo Rundo, Ramona Woitek, Stephan Ursprung, Lorena Escudero, Hilal Sahin, Ionut-Gabriel Funingana, Joo-Ern Ang, Mercedes Jimenez-Linan, Tristan Lawton, Gaurav Phadke, Sally Davey, **Nghia Q. Nguyen**, Florian Markowetz, James D. Brenton, Mireia Crispin-Ortuzar, Helen Addley, and Evis Sala "Ultrasound-guided targeted biopsies of CT-based radiomic tumour habitats: technical development and initial experience in metastatic ovarian cancer," *European Radiology* (2020).
   https://doi.org/10.1007/s00330-020-07560-8
4. Wentian Chen, Chao Tao, **Nghia Q. Nguyen**, Richard W. Prager, and Xiaojun Liu "Photoacoustic-ultrasonic dual mode microscopy with local speed-of-sound estimation," *Optics Letters,* vol. 45, no. 14, pp. 3840-3843, 2020.
5. **Nghia Q. Nguyen** and Richard W. Prager, "A spatial coherence approach to minimum variance beamforming for plane-wave compounding," *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control,* vol. 65, no. 4, pp. 522-534, 2018.
6. **Nghia Q. Nguyen**, Richard W. Prager, and Michael F. Insana,"Task-based optimal design and efficient implementation of ultrasound beamformers," *Journal of the Acoustical Society of America,* vol. 141, no 6, pp. 4427-4437, 2017.
7. **Nghia Q. Nguyen** and Richard W. Prager, "Ultrasound pixel-based beamforming with phase alignments of focused beams," *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control,* vol. 64, no. 6, pp. 937-946, 2017.
8. **Nghia Q. Nguyen** and Richard W. Prager, "Minimum variance approaches to ultrasound pixel-based beamforming," *IEEE Transactions on Medical Imaging,* vol. 36, no. 1, pp. 374-384, 2017.
9. **Nghia Q. Nguyen**, Richard W. Prager, and Michael F. Insana,"A task-based analytical framework for ultrasonic beamformer comparison," *Journal of the Acoustical Society of America,* vol. 140, no. 2, pp. 1048-1059, 2016.
10. **Nghia Q. Nguyen** and Richard W. Prager, "High-resolution ultrasound imaging with unified pixel-based beamforming," *IEEE Transactions on Medical Imaging,* vol. 35, no. 1, pp. 98-108, 2016.
11. **Nghia Q. Nguyen**, Craig K. Abbey, and Michael F. Insana, "Objective assessment of sonographic quality. II. Acquisition information spectrum," *IEEE Transactions on Medical Imaging,* vol. 32, no. 4, pp. 691-698, 2013.
12. **Nghia Q. Nguyen**, Craig K. Abbey, and Michael F. Insana, "Objective assessment of sonographic quality. I. Task information," *IEEE Transactions on Medical Imaging,* vol. 32, no. 4, pp. 683-690, 2013.
13. Craig K. Abbey, **Nghia Q. Nguyen**, and Michael F. Insana, "Effects of frequency and bandwidth on diagnostic information transfer in ultrasonic B-mode imaging," *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control,* vol. 59, no. 6, pp. 1115-1126, 2012.
14. **Nghia Q. Nguyen**, Craig K. Abbey, and Michael F. Insana, "An adaptive filter to approximate the Bayesian strategy for sonographic beamforming," *IEEE Transactions on Medical Imaging,* vol. 30, no. 1, pp. 28-37, 2011.
15. Craig K. Abbey, **Nghia Q. Nguyen**, and Michael F. Insana, "Optimal beamforming in ultrasound using the ideal observer," *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control,* vol. 57, no. 8, pp. 1782-1796, 2010.

- **Book Chapter (*Invited*)**
  1. **Nghia Q. Nguyen**, Craig K. Abbey, and Michael F. Insana,"Task-based design and evaluation of ultrasonic imaging systems," in *Ultrasound Imaging and Therapy*, A. Fenster and J.C. Lacefield, Eds. Boca Raton, FL: CRC Press/Taylor & Francis, 2015.

- **Conferences**
  1. **Nghia Q. Nguyen** and Richard W. Prager, "Mean-squared error beamforming for coherent plane-wave compounding," in *Proceedings of the IEEE Ultrasonics Symposium*, pp. 316-319, 2019.
  2. **Nghia Q. Nguyen** and Richard W. Prager, "Minimum variance beamformers for coherent plane-wave compounding," in *Proceedings SPIE Medical Imaging: Ultrasonic Imaging and Signal Processing*, pp. 1013912-1–10, 2017.
  3. Michael F. Insana, **Nghia Q. Nguyen**, and Craig K. Abbey, "Beamforming designs for breast sonography," in *Proceedings of the IEEE Ultrasonics Symposium*, pp. 2233-2236, 2014.
  4. **Nghia Q. Nguyen** and Lianjie Huang, "Ultrasound fat-ray tomography for breast cancer characterization," in *Proceedings of American Institute of Ultrasound in Medicine*, pp. S100, 2014.
  5. Lianjie Huang, Youzuo Lin, Zhigang Zhang, **Nghia Q. Nguyen**, Yassin Labyed, Kenneth Hanson, Daniel Sandoval, and Michael Williamson, "Breast ultrasound tomography using virtual sources," in *Proceedings of American Institute of Ultrasound in Medicine*, pp. S21, 2014.
  6. **Nghia Q. Nguyen** and Lianjie Huang, "Ultrasound bent-ray tomography using both transmission and reflection data," in *Proceedings SPIE Medical Imaging: Ultrasonic Imaging and Signal Processing*, pp 9040-0R.1-10, 2014.
  7. Lianjie Huang, Youzuo Lin, Zhigang Zhang, **Nghia Q. Nguyen**, Yassin Labyed, Kenneth Hanson, Daniel Sandoval, and Michael Williamson, "Breast ultrasound tomography using virtual sources and both transmission and reflection data," in *Proceedings SPIE Medical Imaging: Ultrasonic Imaging and Signal Processing*, pp 9040-0T.1-12, 2014.
  8. Lianjie Huang, Youzuo Lin, Zhigang Zhang, **Nghia Q. Nguyen**, Yassin Labyed, "Synthetic-aperture ultrasound tomography using both transmission and reflection data simultaneously," in *38^{th} International Symposium on Ultrasonic Imaging and Tissue Characterization,* June 2013.
  9. **Nghia Q. Nguyen**, Craig K. Abbey, and Michael F. Insana, "Acquisition information spectrum for evaluating sonographic quality," in *Engineering in Medicine and Biology Society (EMBC), Annual International Conference of the IEEE*, pp 2302-2305, 2012. (***invited***)
  10. Craig K. Abbey, **Nghia Q. Nguyen**, William D. O'Brien Jr., and Michael F. Insana, "An ideal observer approach to mechanical limits in B-mode ultrasound imaging," in *Engineering in Medicine and Biology Society (EMBC), Annual International Conference of the IEEE*, pp 2306-2309, 2012. (***invited***)
  11. Craig K. Abbey, **Nghia Q. Nguyen**, and Michael F. Insana, "Frequency, bandwidth, and information transfer in B-mode imaging," in *Proceedings SPIE Medical Imaging: Ultrasonic Imaging and Signal Processing*, pp 8320-0I.1-8, 2012.
  12. **Nghia Q. Nguyen**, Craig K. Abbey, and Michael F. Insana, "Analysis of minimum-variance and Wiener-filtered beamforming strategies," in *Proceedings of the IEEE Ultrasonics Symposium*, pp. 2444-2447, 2011.
  13. **Nghia Q. Nguyen**, Craig K. Abbey, and Michael F. Insana, "Detectability index describes the information conveyed by a sonographic image," in *Proceedings of the IEEE Ultrasonics Symposium*, pp. 680-683, 2011.
  14. **Nghia Q. Nguyen**, Craig K. Abbey, and Michael F. Insana, "Robustness of beamforming in the Bayesian observer approach," in *Proceedings of the IEEE Ultrasonics Symposium*, pp. 995-998, 2010.
  15. Craig K. Abbey, **Nghia Q. Nguyen**, and Michael F. Insana, "Cystic resolution and task performance in beamforming," in *Proceedings of the IEEE Ultrasonics Symposium*, pp. 1747-1750, 2010.
  16. **Nghia Q. Nguyen**, Craig K. Abbey, Rebecca D. Yapp, and Michael F. Insana, "Tomographic reconstruction of the pulse-echo spatial temporal impulse response," in *Proceedings SPIE Medical Imaging: Ultrasonic Imaging and Signal Processing*, pp 7629-14.1-11, 2010.
  17. **Nghia Q. Nguyen**, Craig K. Abbey, and Michael F. Insana, "Ultrasonic array beamforming with iterative spatial filters," in *Proceedings SPIE Medical Imaging: Ultrasonic Imaging and Signal Processing*, pp 7265-0A.1-12, 2009.

- **Conferences (cont.)**

18. Craig K. Abbey, **Nghia Q. Nguyen**, and Michael F. Insana, "An ideal observer approach to beamforming," in *Proceedings SPIE Medical Imaging: Ultrasonic Imaging and Signal Processing*, pp 6920-06.1-8, 2008.

- **Theses**

1. **Nghia Q. Nguyen**, "Information theoretic design of breast sonography," M.S. thesis, University of Illinois at Urbana-Champaign, Urbana, IL, Dec 2009.
   Available (*online*): http://hdl.handle.net/2142/14624
2. **Nghia Q. Nguyen**, "Objective assessment of sonographic quality for breast cancer imaging," Ph.D. thesis, University of Illinois at Urbana-Champaign, Urbana, IL, May 2012.
   Available (*online*): http://hdl.handle.net/2142/31110

Presentations

1. **Advanced in ultrasound imaging for medical applications**, *SCR Seminar Series at Queens' College*, Cambridge, United Kingdom, Oct. 2020.
2. **Mean-squared error beamforming for coherent plane-wave compounding**, *IEEE International Ultrasonics Symposium*, Glasgow, United Kingdom, Oct. 2019.
3. **A new MMSE beamformer for coherent plane-wave compounding**, *Gordon Research Conference on Image Science*, Stonehill College, Easton, Massachusetts, Jun. 2018.
4. **Minimum variance beamformers for coherent plane-wave compounding**, *SPIE Medical Imaging Conference*, Orlando, Florida, Feb. 2017.
5. **Task-based taxonomy to ultrasonic beamformers**, *Gordon Research Conference on Image Science*, Stonehill College, Easton, Massachusetts, Jun. 2016.
6. **Ultrasound fat-ray tomography for breast cancer characterization**, *AIUM annual convention*, Las Vegas, Nevada, Apr. 2014.
7. **Ultrasound bent-ray tomography using both transmission and reflection data**, *SPIE Medical Imaging Conference*, San Diego, California, Feb. 2014.
8. **Advances in designing and evaluating ultrasound imaging systems for breast cancer diagnosis**, *Visualization Seminar*, Computer and Data Sciences Department, Computational Research Division, Lawrence Berkeley National Laboratory, Oct. 2013.
9. **Analysis of minimum-variance and Wiener-filtered beamforming strategies**, *IEEE International Ultrasonics Symposium*, Orlando, Florida, Oct. 2011.
10. **Detectability index describes the information conveyed by a sonographic image**, *IEEE International Ultrasonics Symposium*, Orlando, Florida, Oct. 2011.
11. **Ultrasonic array beamformers that maximize diagnostic information**, *Digital Signal Processing Seminar*, Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Dec. 2010.
12. **Ultrasonic array beamforming with iterative spatial filters**, *SPIE Medical Imaging Conference*, Orlando, Florida, Feb. 2009.
13. **Information theoretic approaches to ultrasonic system design**, *Bioacoustics Research Laboratory Seminar*, Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Dec. 2008.
14. **Information theoretic approaches to ultrasonic system design: Beamforming with iterative spatial filters**, *156th Meeting of the Acoustical Society of America*, Miami, Florida, Oct. 2008