List of Publications

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Journal Articles

[1] M. Jakovljevic, **S. Schoen Jr**, M. Wang, X. Wang, K. Thomenius, and A. E. Samir, "Power-efficient retrospective transmit beamforming in range-Doppler frequency domain," *Under Review*, 2025.

[2] T. T. Pierce, K. Naja, **S. Schoen Jr**, R. Tadross, M. H. Wang, A. Ozturk, K. R. Pope, D. T. Hunt, L. A. Ling, S. K. Dayavansha, M. Peters, A. B. Iafrate, N. Mercaldo, M. J. Washburn, V. Kumar, K. Sandstrom, *et al.*, "Liver Shear Wave Elastography Using a Mechanical Index Exceeding Regulatory Limits is Safe and Effective," *Radiology Advances*, 2025.

[] **S. Schoen Jr**, B. Lause, M. Jakovljevic, R. Tadross, M. Washburn, and A. E. Samir, "Wavefield Correlation Imaging in Arbitrary Media with Inherent Aberration Correction," *Under Review*, 2025.

[] **S. Schoen Jr**, T. T. Pierce, M. Jakovljevic, S. D. R. Jeggari, A.-R. Ali, R. Tadross, B. Lause, D. Hunt, K. Pope, M. Washburn, and A. E. Samir, "Optimized Coherence Masking Improves Ultrasound Imaging of Kidney Cysts," *Under Review*, 2025.

[4] L. Zhuang, **S. Schoen Jr**, H. Zebker, J. Dahl, and M. Jokovljevic, "Adapting the Chirp Scaling Algorithm to Ultrasound Synthetic Aperture Transmit Sequences," *Under Review*, 2025.

[5] **S. Schoen Jr**, M. Wang, S. Dayavansha, K. Naja, V. Kumar, K. Pope, L. Ling, D. Hunt, M. K. Peters, A. Iafrate, N. Mercaldo, K. Sandstrom, T. Kim, M. J. Washburn, T. T. Pierce, and A. E. Samir, "Increased Mechanical Index Improves Shear Wave Elastography: Pilot Study of Signal Enhancement," *Ultrasound in Medicine and Biology*, vol. 51, no. 7, Jul. 2025. DOI: 10.1016/j.ultrasmedbio.2025.03.003.

[6] A. K. Kafei, **S. Schoen Jr**, I. Candel, Y. Gu, P. Guo, K. Thomenius, T. T. Pierce, M. H. Wang, R. Tadross, M. Washburn, H. Rivaz, and A. E. Samir, "Combining Deep Data-driven and Physics-inspired Learning for Shear Wave Speed Estimation in Ultrasound Elastography," *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*,

vol. 72, no. 6, pp. 806–816, Jun. 2025. DOI: 10.1109/TUFFC.2025.3561599.

[7] **S. Schoen Jr**, V. Kumar, Y. Gu, S. K. Dayavansha, R. Tadross, K. Thomenius, M. Washburn, and A. E. Samir, "Efficient Aberration Correction via Optimal Bulk Speed of Sound Compensation," *Under Review*, 2024. DOI: 10.48550/arXiv.2303.02018.

[8] **S. Schoen Jr**, A. Prasov, I. Candel, S. Arshad, M. Ottensmeyer, L. Brattain, B. Telfer, and A. E. Samir, "Microbubble Contrast Agents Improve Detection of Active Hemorrhage," *IEEE Open Journal of Engineering in Medicine and Biology*, 2024. DOI: 10.1109/OJEMB.2024.3414974.

[9] M. Lerendegui, K. Riemer, P. George, A. J. M. Lachlan, B. Wang, A. Chavignon, M. Ashikuzzaman, O. Couture, B. Helfield, M. R. Lowerison, H. Rivaz, A. E. Samir, G. Schmitz, **S. Schoen Jr**, P. Song, T. Stevans, *et al.*, "ULTRA-SR: assessment of Ultrasound Localisation and Tracking Algorithms for Super Resolution Imaging," *IEEE Transactions on Medical Imaging*, vol. 43, no. 8, pp. 2970–2987, Aug. 2024. DOI: 10.1109/TMI.2024.3388048.

[10] A. Ozturk, T. T. Pierce, Q. Li, M. Baikpour, I. Rosado-Mendez, M. H. Wang, **S. Schoen Jr**, S. K. Gu Yuyang amd Dayavansha, V. Kumar, and A. E. Samir, "The Future is Beyond Bright: The Evolving Role of Ultrasound for Liver Disease," *Radiology*, vol. 309, no. 2, Nov. 2023. DOI: https://doi.org/10.1148/radiol.223146.

[11] X. Wang, J. C. Bamber, R. Esquivel-Sirvent, J. Ormachea, P. S. Sidhu, K. E. Thomenius, **S. Schoen Jr**, S. Rosenzweig, and T. T. Pierce, "Ultrasonic Sound Speed Estimation for Liver Fat Quantification: A Review by the AIUM-RSNA QIBA Pulse-Echo Quantitative Ultrasound Initiative," *Ultrasound in Medicine and Biology*, vol. 49, no. 11, pp. 2327–2335, Nov. 2023. DOI: 10.1016/j.ultrasmedbio.2023.06.021.

[12] Y. Gu, V. Kumar, S. K. Dayavansha, **S. Schoen Jr**, R. Tadross, K. Thomenius, M. Washburn, and A. E. Samir, "Propagation-invariant acoustic beams for adaptable shear wave imaging," *Science Advances*, vol. 9, no. 44, Nov. 2023. DOI: 10.1126/sciadv.adi6129.

[13] L. Zhang, C. Marcus, D. Mejorado, **S. Schoen Jr**, T. T. Pierce, V. Kumar, S. V. Fernandez, D. Hunt, Q. Li, I. Iftekhar, D. S. Shuvo, W. Du, H. Edenbaum, L. Jin, W. Liu, F. Li, *et al.*, "Conformable Phased Array Ultrasound Patch for Bladder Volume Monitoring," *Nature Electronics*, vol. 7, pp. 77–90, Nov. 2023. DOI: https://doi.org/10.1038/s41928-023-01068-x.

[14] Z. Song, S. Wang, Q. Li, A. Ozturk, V. Mittal, **S. Schoen Jr**, S. Ramaswamy, T. T. Pierce, A. E. Samir, Y. C. Eldar, C. Anantha, and V. Kumar, "Memory-efficient low-compute segmentation algorithms for edge ultrasound devices: Continuous bladder monitoring," *Scientific Reports*, vol. 13, no. 6450, Sep. 2023. DOI: 10.1038/s41598-023-42000-9.

[15] **S. Schoen Jr**, M. S. Kilnic, H. Lee, Y. Guo, F. L. Degertekin, G. F. Woodworth, and C. D. Arvanitis, "Towards controlled drug delivery in brain tumors with microbubble-enhanced focused ultrasound," *Advanced Drug Delivery Reviews*, vol. 180, no. 114043, 2022. DOI: 10.1016/j.addr.2021.114043.

[16] **S. Schoen Jr**, P. P. Dash, and C. D. Arvanitis, "Experimental Demonstration of Trans-skull Volumetric Passive Acoustic Mapping with the Heterogeneous Angular Spectrum Approach," *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, vol. 69, no. 2, pp. 534–542, 2022. DOI: 10.1109/TUFFC.2021.3125670.

[17] H. Lee, Y. Guo, J. L. Ross, **S. Schoen Jr**, F. L. Degertekin, and C. D. Arvanitis, "Spatially targeted brain cancer immunotherapy with closed loop controlled focused ultrasound and immune checkpoint blockade," *Science Advances*, vol. 8, no. 46, 2022. DOI: 10.1126/sciadv.add2288.

[18] **S. Schoen Jr**, Z. Zhao, C. Huang, S. Chen, and C. D. Arvanitis, "Morphological Reconstruction Improves Microvessel Mapping and Characterization in Super-Resolution Ultrasound," *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, vol. 68, no. 6, pp. 2141–2149, 2021. DOI: 10.1109/TUFFC.2021.3057540.

[19] **S. Schoen Jr** and C. D. Arvanitis, "Acoustic source localization with the angular spectrum approach in continuously stratified media," *The Journal of the Acoustical Society of America*, vol. 148, no. 4, EL333–EL339, 2020. DOI: 10.1121/10.0002095.

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[21] A. Patel, **S. J. Schoen Jr**, and C. D. Arvanitis, "Closed loop spatial and temporal control of cavitation activity with passive acoustic mapping," *IEEE Transactions on Biomedical Engineering*, vol. 66, no. 7, pp. 2022–2031, Jul. 2019, ISSN: 0018-9294. DOI: 10.1109/TBME.2018.2882337.

Invited Talks

[1] **S. J. Schoen Jr**, "Microbubble contrast agents improve detection of active hemorrhage," in *IEEE Engineering in Medicine and Biology Seminar*, Dec. 2024.

[2] ——, "Diagnostic ultrasound in the liver: Challenges and opportunities," in *Joint GT-ASA and IEEE IUS Student Chapter Seminar*, ser. Georgia Tech, Oct. 2023.

[3] ——, "Ultrasound through the skull: Seeing and treating noninvasively," in *University of Texas at Austin Acoustics Seminar*, Virtual, Nov. 2021.

[4] ——, "Towards efficient methods for transcranial ultrasound monitoring & control," in *2020 Joint AAPM — Comp Meeting*, ser. American Association of Physicists in Medicine, Virtual, Jul. 2020.

Patents

[1] **S. J. Schoen Jr**, A.-R. Ali, T. T. Pierce, A. E. Samir, M. Wang, and M. Washburn, *Automated conditionally increased acoustic output algorithm*, Patent Application, Dec. 2024.

[2] C. D. Arvanitis, A. Patel, **S. J. Schoen Jr**, and Z. Zhao, *Systems and methods for ultrasound imaging and focusing*, US Patent Pending PCT/US2019/060217, Nov. 2019.

Theses

[1] **S. J. Schoen Jr**, "Trans-skull ultrasound for imaging and therapy," PhD Dissertation, Georgia Institute of Technology, Dec. 2020.

[2] ——, "Acoustic characterization of encapsulated microbubbles at seismic frequencies," MS Thesis, The University of Texas at Austin, Dec. 2013.

Conference Presentations

[1] J. Gupta, I. Candel, **S. Schoen Jr**, S. Arshad, B. Telfer, T. T. Pierce, and A. E. Samir, "Improving Contrast Enhanced Ultrasound Sensitivity for Active Hemorrhage in a High-Fidelity Phantom," in *2025 IEEE International Ultrasonics Symposium*, Utrecht, Netherlands, Sep. 2025.

[2] A. K. Tehrani, H. Rivaz, **S. Schoen Jr**, I. Candel, M. Wang, M. Washburn, K. Thomenius, and A. E. Samir, "Particle Velocity Tracking in Shear Wave Elastography Using a Mamba-Based Spatiotemporal Network," in *2025 IEEE International Ultrasonics Symposium*, Utrecht, Netherlands, Sep. 2025.

[3] J. F. Gupta, S. Arshad, I. Candel, **S. Schoen Jr**, M. Ottensmeyer, T. T. Pierce, A. E. Samir, and B. Telfer, "Contrast-Enhanced Ultrasound for Localizing Active Hemorrhage," in *Military Health Research Symposium*, Kissimmee, FL, Aug. 2025.

[4] **S. Schoen Jr**, B. Lause, M. Jakovljevic, R. Tadross, M. Washburn, and A. E. Samir, "Wavefield Correlation Imaging in Arbitrary Media with Inherent Aberration Correction," in *Journal of the Acoustical Society of America*, New Orleans, LA USA, May 2025.

[3] **S. Schoen Jr**, T. T. Pierce, M. Jakovljevic, S. D. R. Jeggari, D. Hunt, K. Pope, B. Lause, R. Tadross, M. Wang, M. Washburn, and A. E. Samir, "Combined Speed of Sound Correction and Coherence Masking Improves Ultrasound Imaging of Renal Cysts," in *Journal of the Acoustical Society of America*, New Orleans, LA USA, May 2025.

[5] M. H. Manohara, **S. Schoen Jr**, D. U. Yildirim, A. E. Samir, M. H. Perrot, P. Garacha, and A. P. Chandrasakan, "An Analog Front End for Bladder Ultrasound using Power Gating for Intra-Image Sparsity," in *2024 IEEE International Ultrasonics Symposium*, Boston, MA USA, Apr. 2025.

[6] T. T. Pierce, K. Naja, **S. Schoen Jr**, R. Tadross, M. H. Wang, T. Pope Kathleen, D. T. Hunt, L. A. Ling, S. Dayavansha, M. Peters, A. Iafrate, N. Mercaldo, M. Washburn, V. Kumar, K. Sandstrom, T. Kim, *et al.*, "Acoustic Output Exceeding Regulatory Limits is Safe and Decreases Shear Wave Elastography Measurement Variability," in *2024 Radiological Society of North America*, Chicago, IL, Dec. 2024.

[7] M. Jakovljevic, **S. Schoen Jr**, M. Wang, L. Zhuang, and A. E. Samir, "Efficient Retrospective Transmit Focusing with Range-Doppler Algorithm," in *2024 IEEE International Ultrasonics Symposium*, Taipei, Taiwan, Sep. 2024.

[8] **S. Schoen Jr**, S. K. Dayavansha, M. Wang, R. Tadross, M. Washburn, and A. E. Samir, "Increased Mechanical Index Safely Enhances Shear Wave Elastography Quality," in *2024 IEEE International Ultrasonics Symposium*, Taipei, Taiwan, Sep. 2024.

[9] A. K. Tehrani, H. Rivaz, **S. Schoen Jr**, Y. Gu, I. Candel, M. Wang, M. Washburn, K. Thomenius, and A. E. Samir, "Improved Shear Wave Estimation using Optimization-based Tracking and Adaptive Physics-inspired Deep Neural Network," in *2024 IEEE International Ultrasonics Symposium*, Taipei, Taiwan, Sep. 2024.

[10] Y. Gu, S. Dayavansha, **S. Schoen Jr**, E. Feleppa, M. H. Wang, R. Tadross, I. Candel, M. Jakovljevic, K. Thomenius, and A. E. Samir, "Shear wave elasticity imaging via propagation invariant acoustic beams," in *2024 Ultrasound Imaging and Tissue Characterization Conference*, Arlington, VA, Jun. 2024.

[11] **S. Schoen Jr**, A. K. Z. Tehrani, and A. E. Samir, "Deep Learning–Based Microbubble Localization towards Improved Super-resolution Ultrasound," in *Journal of the Acoustical Society of America*, Sydney, NSW Australia, Dec. 2023. DOI: 10.1121/10.0023049.

[12] T. T. Pierce, M. Ottensmeyer, A. Som, L. Brattain, J. S. Weblin, P. D. Sutphin, **S. Schoen Jr**, M. R. Johnson, L. Gjesteby, B. A. Telfer, and A. E. Samir, "Individualized Ultrasound-Guided Intervention Phantom Development, Fabrication, and Proof of Concept," in *IEEE Engineering in Medicine and Biology Conference*, Sydney, Australia, Jul. 2023.

[13] B. Telfer, **S. Schoen Jr**, I. Candel, S. Arshad, M. Ottensmeyer, L. Brattain, and A. Samir, "Contrast-Enhanced Ultrasound To Detect Active Bleeding," in *IEEE Engineering in Medicine and Biology Society*, Sydney, NSW Australia, Jul. 2023.

[14] **S. Schoen Jr**, M. Jakovljevic, and A. E. Samir, "Plane Wave Imaging in Arbitrary Media via Efficient Phase Compoensation," in *International Symposium on Ultrasound Imaging and Tissue Characterization*, Arlington, VA, Jun. 2023.

[15] **S. Schoen Jr** and A. E. Samir, "Fast Spectral Approach for Delay Correction in Heterogeneous Media," in *Journal of the Acoustical Society of America*, Chicago, IL, May 2023. DOI: 10.1121/10.0018184.

[16] H. Lee, Y. Guo, J. L. Ross, **S. Schoen Jr**, F. L. Degertekin, and C. D. Arvanitis, "Spatially targeted immunotherapy in glioma with closed-loop microbubble enhanced focused ultrasound control," in *International Society for Therapeutic Ultrasound*, Lyon, France, Apr. 2023.

[17] **S. J. Schoen Jr**, V. Kumar, L. Brattain, B. Telfer, and A. E. Samir, "Contrast-enhanced ultrasound to detect active bleeding," in *Journal of the Acoustical Society of America*, Nashville, TN, Dec. 2022.

[18] **S. Schoen Jr**, V. Kumar, Y. Gu, S. K. Dayavansha, R. Tadross, K. Thomenius, M. Washburn, and A. E. Samir, "Optimal abdominal imaging with bulk speed of sound beamforming," in *2022 IEEE International Ultrasonics Symposium*, Venice, Italy, Oct. 2022.

[19] **S. Schoen Jr**, A. E. Samir, and V. Kumar, "MR for ULTRA-SR: Improved Localization with Morphological Image Processing," in *2022 IEEE International Ultrasonics Symposium*, Venice, Italy, Oct. 2022.

[20] J. R. Young, **S. Schoen Jr**, V. Kumar, and A. E. Samir, "SoundAI: Aberration Correction from Learned Sound Speed Maps," in *2022 IEEE International Ultrasonics Symposium*, Venice, Italy, Oct. 2022. DOI: 10.1109/IUS54386.2022.9958284.

[21] **S. Schoen Jr**, F. Heidari, M. Parameswaran, E. Cheah, A. Ozturk, M. Martin, V. Kumar, T. T. Pierce, and A. E. Samir, "Accurate fibrosis staging from unstructured data with natural language processing," in *American Institute of Ultrasound in Medicine*, San Diego, CA, Mar. 2022.

[22] P. P. Dash, **S. Schoen Jr**, and C. D. Arvanitis, "Experimental demonstration of 3D transcranial passive acoustic mapping with the heterogeneous angular spectrum approach," in *2021 IEEE International Ultrasonics Symposium*, Xi'an, China, Sep. 2021.

[23] H. Lee, S. Schoen Jr, **Y. Guo**, C. Kim, F. L. Degertekin, and C. Arvanitis, "Acoustic emission based closed-loop focused ultrasound system for targeted and controlled bbb-opening in rodents," in *2021 IEEE International Ultrasonics Symposium*, Xi'an, China, Sep. 2021.

[24] H. Lee, **S. Schoen Jr**, Y. Guo, C. Kim, and C. Arvanitis, "A closed-loop focused ultrasound system for controlled and targeted antibody delivery in central nervous system," in *American Institute of Ultrasound in Medicine*, Virtual, Apr. 2021.

[25] **S. Schoen** and C. Arvanitis, "Spatial characterization of high intensity focused ultrasound fields in the brain," *The Journal of the Acoustical Society of America*, vol. 148, no. 4, pp. 2560–2560, 2020. DOI: 10.1121/1.5147103. eprint: https://doi.org/10.1121/1.5147103.

[26] **S. Schoen Jr**, Z. Zhao, C. Huang, S. Chen, and C. D. Arvanitis, "Computationally efficient methods for vascular characterization with super-resolution ultrasound," in *Biomedical Engineering Society 2020 Annual Meeting*, Virtual, Oct. 2020.

[27] H. Lee, **S. Schoen Jr**, Y. Guo, C. Kim, and C. D. Arvanitis, "Autonomous ultrasound system for targeted drug delivery in central nervous system with sub-millimeter targeting accuracy," in *2020 IEEE International Ultrasonics Symposium*, Las Vegas, NV USA, Sep. 2020.

[28] **S. Schoen Jr**, Z. Zhao, C. Huang, S. Chen, and C. D. Arvanitis, "Super-resolution ultrasound with morphological image reconstruction and local projection for microvascular characterization," in *2020 IEEE International Ultrasonics Symposium*, Las Vegas, NV USA, Sep. 2020.

[29] **S. Schoen Jr** and C. Arvanitis, "Heterogeneous angular spectrum method for trans-skull imaging and focusing," *The Journal of the Acoustical Society of America*, vol. 146, no. 4, pp. 2813–2813, 2019. DOI: 10.1121/1.5136742.

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[31] **S. J. Schoen Jr**, Z. Zhao, Y. Guo, and C. D. Arvanitis, "Spectrally resolved super-resolution ultrasound for microvascular imaging and quantification," in *2019 IEEE International Ultrasonics Symposium*, Glasgow, Scotland, Oct. 2019.

[32] **S. J. Schoen Jr**, A. Patel, and C. D. Arvanitis, "Real-time closed-loop spatiotemporal control of cavitation activity with passive acoustic mapping," in *2018 IEEE International Ultrasonics Symposium*, Kobe, Japan, Oct. 2018.

[33] **S. J. Schoen Jr**, Z. Zhao, and C. D. Arvanitis, "Super-resolution passive acoustic imaging of microbubbles," in *Biomedical Engineering Society 2018*, Atlanta, GA USA, Oct. 2018.

[34] **S. J. Schoen Jr**, A. Patel, and C. D. Arvanitis, "A real-time passive acoustic mapping–based cavitation controller," in *18th Meeting of the International Society for Therapeutic Ultrasound*, ser. International Society for Therapeutic Ultrasound, Nashville, TN USA, May 2018.

[35] **S. J. Schoen Jr** and C. D. Arvanitis, "Passive acoustic mapping in aberrating media with the angular spectrum approach," *The Journal of the Acoustical Society of America*, vol. 141, no. 5, p. 3459, 2017. DOI: 10.1121/1.4987175.

[36] ——, "Passive acoustic mapping with the angular spectrum approach and methods for aberration correction," in *2017 Joint IEEE ISAF-IWATMD-PFM Conference*, Atlanta, Georgia, Jun. 2017.

[37] B. J. Copenhaver, **S. Schoen Jr**, and M. R. Haberman, "Toward reliable metrics for sacred harp singing spaces," *The Journal of the Acoustical Society of America*, vol. 134, no. 5, pp. 3969–3969, 2013. DOI: 10.1121/1.4830456.

[38] **S. Schoen Jr**, Y. A. Ilinskii, E. A. Zabolotskaya, and M. F. Hamilton, "Low-frequency measurement of encapsulated bubble compressibility," *The Journal of the Acoustical Society of America*, vol. 132, no. 3, p. 2039, 2012. DOI: 10.1121/1.4755497.

[39] G. Georgiev, Y. Cabrera, L. Wielgus, **S. Schoen Jr**, D. Ivy, and P. Cebe, "Melt-quench formed smectic phase in ipp/cnt nanocomposites and its re-crystallization," in *Symposium HH/II/JJ: Polymer-Based Materials and Composites – Synthesis, Assembly and Applications*, ser. MRS Proceedings, vol. 1312, 2011. DOI: 10.1557/opl.2011.120.

[40] G. Georgiev, **S. Schoen Jr**, D. Ivy, L. Wielgus, Y. Cabrera, and P. Cebe, "Crystallization kinetics in isotactic polypropylene films with carbon nanotubes," in *Symposium HH/II/JJ: Polymer-Based Materials and Composites – Synthesis, Assembly and Applications*, ser. MRS Proceedings, vol. 1312, 2011. DOI: 10.1557/opl.2011.134.

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[45] G. Georgiev, R. Judith, E. Gombos, M. McIntyre, **S. Schoen Jr**, P. Cebe, and M. Mattera, "Isotactic polypropylene carbon nanotube composites – crystallization and ordering behavior," in *Bulletin of the American Physical Society*, vol. 55, Portland, OR: American Physical Society, Mar. 2010.