

# SlicerITKUltrasound: A 3D Slicer extension for scan conversion of B-mode and next-generation ultrasound imaging modalities

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## Software

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## Summary

A 3D Slicer (Fedorov et al. 2012) extension for ultrasound scan conversion during 2D and 3D image generation for traditional B-mode imaging (Matthew M McCormick 2010), but also next-generation ultrasound image modalities like ultrasound spectroscopy (S. R. Aylward et al. 2016), acoustic radiation force imaging (ARFI) (Palmeri et al. 2016), acoustic radiation force shear wave imaging (ARFI-SWEI) (S. J. Rosenzweig 2014), and others. Interfaces are built off the ITKUltrasound library (Matthew Michael McCormick et al. 2014).

## References

- Aylward, S. R., M. McCormick, H. J. Kang, S. Razzaque, R. Kwitt, and M. Niethammer. 2016. “Ultrasound Spectroscopy.” In *2016 IEEE 13th International Symposium on Biomedical Imaging (ISBI)*, 1013–6. doi:10.1109/ISBI.2016.7493437.
- Fedorov, Andriy, Reinhard Beichel, Jayashree Kalpathy-Cramer, Julien Finet, Jean-Christophe Fillion-Robin, Sonia Pujol, Christian Bauer, et al. 2012. “3D Slicer as an Image Computing Platform for the Quantitative Imaging Network.” *Magnetic Resonance Imaging* 30 (9): 1323–41. doi:10.1016/j.mri.2012.05.001.
- McCormick, Matthew M. 2010. “An Open Source, Fast Ultrasound B-Mode Implementation for Commodity Hardware.” *Insight Journal*. <http://hdl.handle.net/10380/3159>.
- McCormick, Matthew Michael, Xiaoxiao Liu, Luis Ibanez, Julien Jomier, and Charles Marion. 2014. “ITK: Enabling Reproducible Research and Open Science.” *Frontiers in Neuroinformatics* 8. doi:10.3389/fninf.2014.00013.
- Palmeri, M., T. Glass, R. Gupta, M. McCormick, A. Brown, T. Polascik, S. Rosenzweig, A. Buck, and K. Nightingale. 2016. “Comparison Between 3d ARFI Imaging and mpMRI in Detecting Clinically-Significant Prostate Cancer Lesions.” In *2016 IEEE International Ultrasonics Symposium (IUS)*, 1–4. doi:10.1109/ULTSYM.2016.7728618.
- Rosenzweig, Stephen J. 2014. “Implementation and Algorithm Development of 3d ARFI and SWEI Imaging for in Vivo Detection of Prostate Cancer.” PhD thesis, Duke University. <http://dukespace.lib.duke.edu/dspace/handle/10161/9062>.