
REFERENCES

Abdalla, A. T., Muqaibel, A. H., and Al-Dharrab, S., "Aspect dependent multipath ghost suppression in TWRI under compressive sensing framework," In *2015 International Conference on Communications, Signal Processing, and their Applications (ICCSPA'15)*, pp. 1-6, 2015.

Ahmad, F., Amin, M.G. and Kassam, S.A., "Synthetic aperture beamformer for imaging through a dielectric wall," *IEEE transactions on aerospace and electronic systems*, vol. 41, no. 1, pp.271-283, 2005.

Ahmad, F. and Amin, M.G., "Noncoherent approach to through-the-wall radar localization," *IEEE transactions on aerospace and electronic systems*, vol. 42, no. 4, pp.1405-1419, 2006.

Ahmad, F., Amin, M.G. and Mandapati, G., "Autofocusing of through-the-wall radar imagery under unknown wall characteristics," *IEEE transactions on image processing*, vol. 16, no. 7, pp.1785-1795, 2007.

Ahmad, F., Zhang, Y. and Amin, M.G., "Three-dimensional wideband beamforming for imaging through a single wall," *IEEE Geoscience and remote sensing letters*, vol. 5, no. 2, pp. 176-179, 2008.

Ahmad, F., Amin, M.G. and Zeman, P.D., "Dual-frequency radars for target localization in urban sensing," *IEEE transactions on aerospace and electronic systems*, vol. 45, no. 4, pp.1598-1609, 2009.

Amin, M.G. and Ahmad, F., "Change detection analysis of humans moving behind walls," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 49, no. 3, pp.1410-1425, 2013a.

Amin, M.G. and Ahmad, F., "Compressive sensing for through-the-wall radar imaging," *Journal of Electronic Imaging*, vol. 22, no. 3, p.030901, 2013b.

Baranoski, E.J., "Through-wall imaging: Historical perspective and future directions," *Journal of the Franklin Institute*, vol. 345, no. 6, pp.556-569, 2008.

Bohleber, P., Sold, L., Hardy, D.R., Schwikowski, M., Klenk, P., Sirguy, P., Cullen, N.J., Potocki, M., Hoffmann, H. and Mayewski, P., "Ground-penetrating radar reveals ice thickness and undisturbed englacial layers at Kilimanjaro's Northern Ice Field," *The Cryosphere*, vol. 11, no. 1, pp.469-482, 2017.

Callera, J., "X-ray backscatter imaging: photography through barriers," *Powder diffraction*, vol. 21, no. 2, pp.132-135, 2006.

Chandra, R., Gaikwad, A.N., Singh, D. and Nigam, M.J., "An approach to remove the clutter and detect the target for ultra-wideband through-wall imaging," *Journal of Geophysics and Engineering*, vol. 5, no. 4, pp.412-419, 2008.

Debes, C., Amin, M.G. and Zoubir, A.M., "Target detection in single-and multiple-view through-the-wall radar imaging," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 47, no. 5, pp.1349-1361, 2009a.

Debes, C., Riedler, J., Amin, M.G. and Zoubir, A.M., "Iterative target detection approach for through-the-wall radar imaging," In *Proceedings of IEEE International Conference on Acoustics, Speech and Signal Processing*, pp. 3061-3064, 2009b.

Debes, C., Riedler, J., Zoubir, A.M. and Amin, M.G., "Adaptive target detection with application to through-the-wall radar imaging," *IEEE Transactions on Signal Processing*, vol. 58, no. 11, pp.5572-5583, 2010a.

Debes, C., Hahn, J., Zoubir, A.M. and Amin, M.G., "Feature extraction in through-the-wall radar imaging," in *Proceedings of IEEE International Conference on Acoustics, Speech and Signal Processing*, pp. 3562-3565, 2010b.

Debes, C., Hahn, J., Zoubir, A.M. and Amin, M.G., "Target discrimination and classification in through-the-wall radar imaging," *IEEE transactions on signal processing*, vol. 59, no. 10, pp.4664-4676, 2011.

Dehmollaian, M. and Sarabandi, K., "Refocusing through building walls using synthetic aperture radar," *IEEE transactions on geoscience and remote sensing*, vol. 46, no. 6, pp.1589-1599, 2008.

Dehmollaian, M., "Through-wall shape reconstruction and wall parameters estimation using differential evolution," *IEEE Geoscience and Remote Sensing Letters*, vol. 8, no. 2, pp. 201-205, 2010.

Easyfit, "Easyfit by Mathwave Technologies" [Online]. Available: <http://www.mathwave.com/easyfit-distribution-fitting.html>.

Farwell, M., Ross, J., Luttrell, R., Cohen, D., Chin, W. and Dogaru, T., "Sense through the wall system development and design considerations," *Journal of the Franklin Institute*, vol. 345, no. 6, pp.570-591, 2008.

Ferris Jr, D.D. and Currie, N.C., "Survey of current technologies for through-the-wall surveillance (TWS)," In *Sensors, C3I, Information, and Training Technologies for Law Enforcement*, vol. 3577, pp. 62-72. 1999.

Forbes, C., Evans, M., Hastings, N. and Peacock, B., *Statistical distributions*, New Jersey, John Wiley & Sons, 2011.

Francke, J., "Applications of GPR in mineral resource evaluations," *In Proceedings of the XIII International Conference on Ground Penetrating Radar*, pp. 1-5, 2010.

Frazier, L. M., "Surveillance through walls and other opaque materials," *IEEE Aerospace and Electronic Systems Magazine*, vol. 11, no. 10, pp. 6-9, 1996.

Gaikwad, A.N., Singh, D. and Nigam, M.J., "Application of clutter reduction techniques for detection of metallic and low dielectric target behind the brick wall by stepped frequency continuous wave radar in ultra-wideband range," *IET radar, sonar & navigation*, vol. 5, no. 4, pp.416-425, 2011a.

Gaikwad, A.N., Singh, D. and Nigam, M.J., "Recognition of target in through wall imaging using shape feature extraction," *In 2011 IEEE International Geoscience and Remote Sensing Symposium*, pp. 957-960, 2011b.

Gentile, C. and Kik, A., "A comprehensive evaluation of indoor ranging using ultra-wideband technology," *EURASIP Journal on Wireless Communications and Networking*, no. 1, p.086031, 2007.

Gonzalez, S., and Woods R., *Digital Image Processing*, New Delhi: Dorling Kindersley, 2009.

Guo, S., Yang, X., Cui, G., Song, Y., and Kong, L., "Multipath ghost suppression for through-the-wall imaging radar via array rotating," *IEEE Geoscience and Remote Sensing Letters*, vol. 15, no. 6, pp. 868-872, 2018.

Hantscher, S., Praher, B., Reizenzahn, A. and Diskus, C.G., "Analysis of imaging radar algorithms for the identification of targets by their surface shape," *In International conference UWB*, 2006a.

Hantscher, S., Praher, B., Reizenzahn, A. and Diskus, C.G., "Comparison of UWB target identification algorithms for through-wall imaging applications," *In European Radar Conference*, pp. 104-107, 2006b.

Haykin, S., *Neural Network A Comprehensive Foundation*, New Delhi: Pearson Education, 2005.

Huang, Q., Qu, L., Wu, B. and Fang, G., "UWB through-wall imaging based on compressive sensing," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 48, no. 3, pp.1408-1415, 2009.

Hunt, A.R., "Use of a frequency-hopping radar for imaging and motion detection through walls," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 47, no. 5, pp.1402-1408, 2009.

Kobayashi, H., and Yamaguchi, Y., "Wall-through Radar Modeling with Multilayered Wall and GTD Nearfield Target," International Conference on Space, Aeronautical and Navigational Electronics 2012 (ICSANE), SANE2012-64, pp. 45-50, Seoul, Korea, Oct 2012.

Kobayashi, H., Takaoka, S., and Yamaguchi, Y., "Novel permittivity estimation for dielectric plate by radar image," *2014 Asia-Pacific Microwave Conference*, Sendai, Japan, pp. 1336-1338, 2014.

Ibrahim, K.M., Hussein, K.F.A. and Ammar, A.E.H.A.E.A., "Land-Buried Object Detection and Target-Shape Recognition in Lossy and Dispersive Soil," *Progress In Electromagnetics Research*, vol. 57, pp.279-298, 2014.

Igel, J., Günther, T. and Kuntzer, M., "Ground-penetrating radar insight into a coastal aquifer: the freshwater lens of Borkum Island," *Hydrology and Earth System Sciences*, vol. 17, no. 2, pp.519-531, 2013.

Islam, M.T., Mahmud, M.Z., Islam, M.T., Kibria, S. and Samsuzzaman, M., "A Low Cost and Portable Microwave Imaging System for Breast Tumor Detection Using UWB Directional Antenna array," *Scientific reports*, vol. 9, no. 1, pp.1-13, 2019.

Jin, T., Chen, B. and Zhou, Z., "Image-domain estimation of wall parameters for autofocusing of through-the-wall SAR imagery," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 51, no. 3, pp.1836-1843, 2012.

Kidera, S., Sakamoto, T. and Sato, T., "High-resolution 3-D imaging algorithm with an envelope of modified spheres for UWB through-the-wall radars," *IEEE Transactions on Antennas and Propagation*, vol. 57, no. 11, pp.3520-3529, 2009.

Kumar, B., Upadhyay, R. and Singh, D., "Development of an adaptive approach for identification of targets (match box, pocket diary and cigarette box) under the cloth with MMW imaging system," *Progress In Electromagnetics Research*, vol. 77, pp.37-55, 2017.

Lagunas, E., Amin, M.G., Ahmad, F. and Nájar, M., "Joint wall mitigation and compressive sensing for indoor image reconstruction," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 51, no. 2, pp.891-906, 2012.

Lai, C.P. and Narayanan, R.M., "Ultrawideband random noise radar design for through-wall surveillance," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 46, no. 4, pp.1716-1730, 2010.

- Li, G. and Burkholder, R.J., "Hybrid matching pursuit for distributed through-wall radar imaging," *IEEE Transactions on Antennas and Propagation*, vol. 63, no. 4, pp.1701-1711, 2015.
- Li, L., Zhang, W. and Li, F., "A novel autofocusing approach for real-time through-wall imaging under unknown wall characteristics," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 48, no. 1, pp.423-431, 2009.
- Li, Z., Kong, L., Jia, Y., Zhao, Z., and Lan, F., "A novel approach of multipath suppression based on sub-aperture imaging in through-wall-radar imaging," in *Proceedings of IEEE Radar Conference*, pp. 1–4, 2013.
- Maaref, N., Millot, P., Pichot, C. and Picon, O., "A study of UWB FM-CW radar for the detection of human beings in motion inside a building," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 47, no. 5, pp.1297-1300, 2009.
- Mirbach, M. and Menzel, W., "A simple surface estimation algorithm for UWB pulse radars based on trilateration," In *IEEE International Conference on Ultra-Wideband (ICUWB)*, pp. 273-277, 2011.
- Mobasser, B.G., and Rosenbaum, Z., "3D classification of through-the-wall radar images using statistical object models," in *Proceedings of IEEE Workshop Image Analysis and Interpretation*, pp. 149–152, 2008.
- Muqaibel, A.H. and Safaai-Jazi, A., "A new formulation for characterization of materials based on measured insertion transfer function," *IEEE Transactions on Microwave Theory and Techniques*, vol. 51, no. 8, pp.1946-1951, 2003.
- Nkwari, P. K. M., Sinha, S., and Ferreira, H. C., "Through-the-wall radar imaging: a review," *IETE Technical Review*, vol. 35, no. 6, pp. 631-639, 2018.
- Oliveri, G., and Massa, A., "Inverse scattering through compressive sensing." In *IEEE Antennas and Propagation Society International Symposium (APSURSI)*, pp. 1115-1116, 2014.
- Orović, I., Stanković, S. and Amin, M., "A new approach for classification of human gait based on time-frequency feature representations," *Signal Processing*, vol. 91, no. 6, pp.1448-1456, 2011.
- Osowski, S., "Fourier and wavelet descriptors for shape recognition using neural networks—a comparative study," *Pattern Recognition*, vol. 35, no. 9, pp.1949-1957, 2002.
- Otsu, N., "A threshold selection method from gray-level histograms," *IEEE transactions on systems, man, and cybernetics*, vol. 9, no. 1, pp.62-66, 1979.

Ozdemir, C., Demirci, S., and Yigit, E., "Practical algorithms to focus B-scan GPR images: theory and application to real data," *Progress In Electromagnetics Research*, vol. 6, pp. 109-122, 2008.

Ram, S.S., Li, Y., Lin, A. and Ling, H., "Doppler-based detection and tracking of humans in indoor environments," *Journal of the Franklin Institute*, vol. 345, no. 6, pp.679-699, 2008.

Ram, S.S. and Ling, H., "Through-wall tracking of human movers using joint Doppler and array processing," *IEEE Geoscience and Remote Sensing Letters*, vol. 5, no. 3, pp.537-541, 2008.

Seng, C.H., Amin, M.G., Ahmad, F. and Bouzerdoum, A., "Image segmentations for through-the-wall radar target detection," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 49, no. 3, pp.1869-1896, 2013.

Setlur, P., Alli, G., and Nuzzo, L., "Multipath exploitation in through-wall radar imaging via point spread functions," *IEEE Transactions on Image Processing*, vol. 22, no. 12, pp. 4571-4586, 2013.

Setlur, P., Amin, M. and Ahmad, F., "Multipath model and exploitation in through-the-wall and urban radar sensing," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 49, no. 10, pp.4021-4034, 2011.

Singh, D., Choudhary, N. K., Tiwari, K. C., and Prasad, R., "Shape recognition of shallow buried metallic objects at X-band using ANN and image analysis techniques," *Progress In Electromagnetics Research*, vol. 13, pp. 257-273, 2009.

Sisma, O., Gaugue, A., Liebe, C. and Ogier, J.M., "UWB Radar: Vision through a wall," In *Personal Wireless Communications*, Springer, Boston, MA, pp. 241-251. 2007.

Smith, G.E. and Mobasseri, B.G., "Robust through-the-wall radar image classification using a target-model alignment procedure," *IEEE Transactions on Image Processing*, vol. 21, no. 2, pp.754-767, 2011.

Soldovieri, F., and Solimene, R., "Through-wall imaging via a linear inverse scattering algorithm," *IEEE Geoscience and Remote Sensing Letters*, vol. 4, no. 4, pp. 513-517, 2007.

Soldovieri, F., Solimene, R., and Prisco, G., "A multiarray tomographic approach for through-wall imaging," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 46, no. 4, pp. 1192-1199, 2008.

Soldovieri, F., Solimene, R. and Pierri, R. "A simple strategy to detect changes in through the wall imaging," *Progress in Electromagnetics Research M*, vol. 7, pp. 1-13, 2009.

Soldovieri, F., Solimene, R., and Ahmad, F., "Sparse tomographic inverse scattering approach for through-the-wall radar imaging," *IEEE Transactions on Instrumentation and Measurement*, vol. 61, no. 12, pp. 3340-3350, 2012.

Solimene, R., Soldovieri, F., Prisco, G., and Pierri, R., "Three-dimensional through-wall imaging under ambiguous wall parameters," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 47, no. 5, pp. 1310-1317, 2009a.

Solimene, R., Brancaccio, A., Pierri, R., and Soldovieri, F., "TWI experimental results by a linear inverse scattering approach," *Progress in Electromagnetics Research*, vol. 91, pp. 259-272, 2009b.

Solimene, R., and Cuccaro, A., "Front wall clutter rejection methods in TWI," *IEEE Geoscience and remote sensing letters*, vol. 11, no. 6, pp. 1158-1162, 2013.

Song, L. P., Yu, C. and Liu, Q. H., "Through-wall imaging (TWI) by radar: 2-D tomographic results and analyses," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 43, no. 12, pp. 2793-2798, 2005.

Tan, Q., Leung, H., Song, Y., and Wang, T., "Multipath ghost suppression for through-the-wall radar," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 50, no. 3, pp. 2284-2292, 2014.

Tang, V.H., Bouzerdoum, A., Phung, S.L. and Tivive, F.H.C., "Enhanced through-the-wall radar imaging using Bayesian compressive sensing," In *Compressive Sensing II International Society for Optics and Photonics*, vol. 8717, p. 87170I, 2013.

Thayaparan, T., Stankovic, L. and Djurovic, I., "Micro-Doppler human signature detection and its application to gait recognition and indoor imaging," *Journal of Franklin Institute*, vol. 345, no. 6, pp.700-722, 2008.

Tivive, F. C., Bouzerdoum, A., and Amin. M. G., "A subspace projection approach for wall clutter mitigation in through-the-wall radar imaging," *IEEE Transactions on Geoscience and Remote Sensing*, vol.53, no. 4, pp. 2108-2122, 2014.

Tiwari, K. C., Singh, D., and Arora, M. K., "Development of a model for detection and estimation of depth of shallow buried non-metallic landmine at microwave X-band frequency," *Progress In Electromagnetics Research*, vol. 79, pp. 225-250, 2008.

Tong, L.T., "Application of ground penetrating radar to locate underground pipes," *Terr Atmos Ocean Sci*, vol. 4, no. 2, pp.171-178, 1993.

Verma, P. K., Gaikwad, A. N., Singh, D., and Nigam, M. J. "Analysis of clutter reduction techniques for through wall imaging in UWB range," *Progress In Electromagnetics Research B*, vol. 17, pp. 29-48, 2009.

Wang, G., Amin, M. G., and Zhang, Y., "New approach for target locations in the presence of wall ambiguity," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 42, no. 1, pp. 301–315, 2006.

Wang, G. and Amin, M. G., "Imaging through unknown walls using different standoff distances," *IEEE Transactions on Signal Processing*, vol. 54, no. 10, pp. 4015–4025, 2006.

Wong, A.K. and Sahoo, P.K., "A gray-level threshold selection method based on maximum entropy principle," *IEEE Transactions on Systems, Man, and Cybernetics*, vol. 19, no. 4, pp.866-871, 1989.

Wu, S., Xu, Y., Chen, J., Meng, S., Fang, G., and Yin, H., "Through-wall shape estimation based on UWB-SP radar," *IEEE Geoscience and Remote Sensing Letters*, vol. 10, no. 5, pp. 1234-1238, 2013.

Yamaguchi, Y., Maruyama, Y., Kawakami, A., Sengoko, M. and Abe, T., "Detection of objects buried in wet snowpack by an FM-CW radar," *IEEE transactions on Geoscience and Remote Sensing*, vol. 29, no. 2, pp.201-208, 1991.

Yan, D., Cui, G., Guo, S., Kong, L., Yang, X. and Liu, T., "Multipath ghosts location and sub-aperture based suppression algorithm for TWIR," In *IEEE Radar Conference (RadarConf)*, pp. 1-4, 2016.

Yang, Y., and Fathy., A. E., "Development and implementation of a real-time see-through-wall radar system based on FPGA," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 47, no. 5, pp. 1270-1280, 2009.

Yang, Y., Zhang, C. and Fathy, A.E., "Development and implementation of ultra-wideband see-through-wall imaging system based on sampling oscilloscope," *IEEE Antennas and Wireless Propagation Letters*, vol. 7, pp.465-468, 2008.

Yigit, E., Demirci, S., Ozdemir, C., and Kavak, A., "A synthetic aperture radar-based focusing algorithm for B-scan ground penetrating radar imagery," *Microwave and optical technology letters*, vol. 49, no. 10, pp. 2534-2540, 2007.

Yoon, Y. S., and Amin, M. G., "Spatial filtering for wall-clutter mitigation in through-the-wall radar imaging," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 47, no. 9, pp. 3192-3208, 2009.

Yoon, Y. S., and Amin, M. G., "High-resolution through-the-wall radar imaging using beamspace MUSIC," *IEEE Transactions on Antennas and Propagation*, vol. 56, no. 6, pp. 1763-1774, 2008.

Zhang, W. and Hoorfar, A., "Three-dimensional real-time through-the-wall radar imaging with diffraction tomographic algorithm," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 51, no. 7, pp.4155-4163, 2012.

Zhang, W. and Hoorfar, A., "Three-dimensional synthetic aperture radar imaging through multilayered walls," *IEEE transactions on antennas and propagation*, vol. 62, no. 1, pp.459-462, 2013.

