

INDUSTRIAL MATHEMATICS IN ULTRASOUND IMAGING

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ABSTRACT

Ultrasound imaging is a widely used tool for visualizing human body's internal organs and quantifying clinical parameters. Due to its advantages such as safety, noninvasiveness, portability, low cost and real-time 2D/3D imaging, diagnostic ultrasound industry has steadily grown. Since the technology advancements such as digital beam-forming, Doppler ultrasound, real-time 3D imaging and automated diagnosis techniques, there are still a lot of demands for image quality improvement, faster and accurate imaging, 3D color Doppler imaging and advanced functional imaging modes. In order to satisfy those demands, mathematics should be used properly and effectively in ultrasound imaging. Mathematics has been used commonly as mathematical modelling, numerical solutions and visualization, combined with science and engineering. In this talk, we describe a brief history of ultrasound imaging, its basic principle, its applications in obstetrics/gynecology, cardiology and radiology, domestic-industrial products, contributions of mathematics and challenging issues in ultrasound imaging.

REFERENCES

1. Jang, J. and Ahn, C. Y., "Industrial Mathematics in Ultrasound Imaging", *Journal of the Korean Society for Industrial and Applied Mathematics*, Vol. 20, 2016, pp. 175-202.