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강연제목: Development of a Large-Aperture Ultrasound Platform for High-Resolution Imaging and Functional Extensions

Abstract:

Ultrasound imaging is evolving beyond its traditional boundaries, now poised to deliver unprecedented spatial resolution and diagnostic precision through real-time, large-aperture systems. By significantly expanding the aperture size and leveraging ultrafast plane and diverging wave transmissions, we mitigate the angular dependencies that have long limited conventional B-mode and Doppler imaging. The result is high-definition, high-speed visualization that enables more objective and reproducible diagnostics—reducing operator dependency and increasing clinical accessibility.

Early implementations using multiple commercial arrays—particularly those with half-wavelength pitch—demonstrate superior image fidelity and a wider field-of-view compared to conventional systems. These advances show promise in applications ranging from vascular assessment to organ-level tissue characterization. They open new possibilities for more robust and operator-independent ultrasound diagnostics, potentially broadening the clinical utility of ultrasound across a wide range of use cases. The system architecture is designed with flexibility and extensibility in mind, including the potential for integration with therapeutic or stimulation-based ultrasound. By combining high-definition imaging with targeted energy delivery capabilities, this platform may serve as a foundation for future image-guided diagnostic and therapeutic approaches.

Brief Biosketch

2013	B.S., Department of Electrical Engineering, POSTECH
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