

Theses and Internships – Electrical Engineering or related fields

We offer a variety of projects, outlined below, and are happy to tailor tasks to your specific interests.

Research Internship (FP) / Thesis Opportunities:

- **Acoustic Transmission Line Design and Optimization:** Simulation of ultrasonic acoustic horns in both Matlab and COMSOL, coupled with the refinement of an existing optimization algorithm. The focus will be on enhancing algorithm stability and incorporating realistic production and measurement tolerances (\pm values) to achieve robust results, utilizing the algorithm's capacity for extensive calculations.
- **Finite Element Model Refinement & Crosstalk Analysis:** Further development of a Finite Element Model for ultrasonic transducers, combined with Laser Doppler Vibrometry (LDV) measurements to investigate and mitigate crosstalk effects.
- **Ultrasonic Trapping:** Investigation of ultrasonic trapping phenomena using ultrasonic transducers. This includes simulation, actuation, and characterization using a measurement microphone, potentially focusing on generating vortices with single-sided transducers.
- **Compact Modelling:** Exploration of alternative theoretical approaches for calculating acoustics in acoustic Transmission lines.
- **Comparative Analysis:** Benchmarking of different Simulation methods (existing Models) with real-world examples.
- **Refractometry with LDV:** Investigating the potential of using Laser-Doppler Vibrometer for refractometry measurements.

Within some of these projects, you will have the opportunity to experience with industry-standard laboratory equipment, including laser Doppler vibrometers, LCR meters, acoustic test fixtures, and FPGA-based measurement systems. We encourage you to contact us to discuss your interests and define a suitable project scope.

We look forward to receiving your application.



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