Jacob C. Ruff

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Education

Texas A&M University, *College Station, TX* GPA 4.0/4.0
Graduated: May 2022
Bachelor of Science - Electrical Engineering & Minor in Computer Science

Texas A&M University, *College Station, TX* GPA 4.0/4.0
Graduating: May 2025
In Progress: Master of Science - Electrical Engineering

Activities

Introduction to Magnetic Resonance TA, *Texas A&M University* January 2023 - May 2023, January 2024 - Present
Teaching Assistant
Instructed Senior Undergraduate Engineers on the physics of MRI, running an MRI scanner and implementing signal processing on MRI images in Matlab
Setup, ran, and processed data from experiments on a 4.7 T magnet that used an EVO spectrometer

Ultrasound Research, *Texas A&M University* May 2021 - May 2022
Undergraduate Researcher
Created gelatin agar Ultrasound phantom containing a suspended fishing line
Simulated speckle and phantoms using Field II in Matlab
Modeling decorrelation curves for simulations and experimental data sets in Matlab

Grader for ECEN 303, ECEN 314 and ECEN 412, *College Station TX* August 2021 - May 2022
ECEN Tutor
Covered statistics topics and problems for students in ECEN 303 Random Signals and Systems
Graded and offered explanations over ECEN 412 Ultrasound Homeworks
Covered Sampling theory and Systems while grading homework for ECEN 314 Signals and Systems

Magnetic Resonance Systems Lab, *Texas A&M University* August 2022 - December 2022
Graduate Research Assistant
Ran tests on and modified a set up for a system that produced high voltage and high power impedance measurements using multiple high speed op amps, a high speed digitizer and RF signal generator.
Put together transmit coil boards for testing detuning using an RF Trap
Programmed pulse sequences for Evo Spectrometer.
Programmed AD9910 chip via SPI communications over Analog Discovery 2 to produce arbitrary RF wavefroms.

Employment

Johns Hopkins Applied Physics Lab, *Laurel Maryland* May 2020 - Dec 2020, May 2022 - August 2022
Digital Signal Processing Intern
Adapted model of received vs transmitted radio symbol rate to linear splines for real time conversion
Improved Simulink model of a radio's carrier and code loops making it HDL synthesizable
Produced a tutorial for installing and compiling radio software
Radar Intern
Verified that a small number of complex exponentials can be used to accurately model the matched filter response from a linearly frequency modulated signal
Analysed interference and resolving pattern for two radar cross section scatters at a variety of wavelengths and distances

Graduate Coursework

ECEN 646 Probability for Information Science
ECEN 601 Mathematical Methods for Signal Processing
ECEN 637 Numerical Methods in Electromagnetics
ECEN 756 Game Theory
ECEN 635 Electromagnetic Theory
ECEN 636 Phased Arrays
ECEN 763 Magnetic Resonance Engineering