

Multiple High Speed Transmission Line Experiment (MuHSTLE)

Number of students: 1 to 2

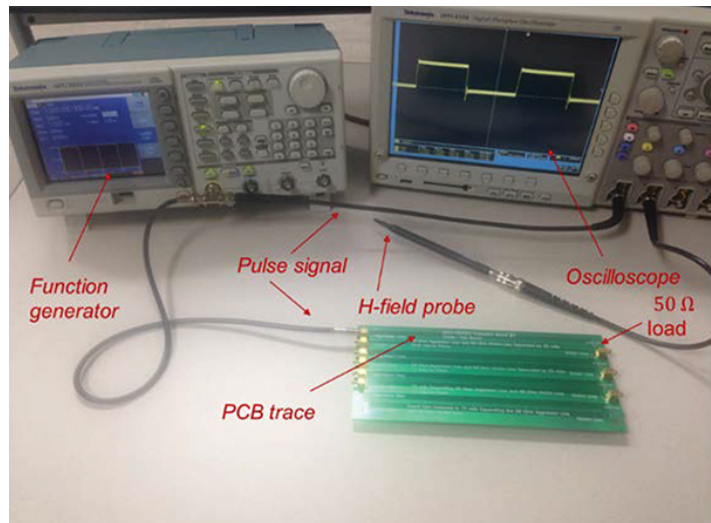
Estimated period of project: 12 months (Senior Project)

Description:

This project will explore differing geometries and characteristics required to attain high performance for high speed transmission lines. High Speed Analog and Digital communication on PCB boards pose a unique challenge for engineers. Signal integrity must meet specifications whilst not impeding overall design parameters [board size, power and component requirements. Researching into edge case designs will allow engineers to develop methodologies for adaptable application. During this project, students will be trained in PCB design and layout, transmission line testing and much more.

In this project we are planning to develop a series of experiments around an array of various transmission lines. Students will design, build and test these lines with specialized equipment at high signal speeds exceeding 40GHz. Students should expect hands on experience with their designs and opportunity to use industry standard equipment such as high speed oscilloscopes, signal generators, frequency and spectrum analyzers.

Students involved in this project, will learn about fundamentals to design of high-speed transmission lines used for amplifiers, data converter systems; including advanced techniques to design, model and analyze such systems. Students are encouraged to discover unique and robust designs. Exceptional results of this experiment will have a chance in pursuit of publication or industry application. Thus, such a project will be valuable experience for students for future careers. Interested students can move forward and participate in design of such systems and work on cutting edge projects (12 months).



Background: Students with a good background on circuit design and RF/EM fields are encouraged to apply. Also, students need to be self-motivated and active. Having good knowledge on relevant tools (e.g. Altium, SPICE, Matlab, Python) is a plus.

Contact person: Prof. Armin Tajalli (armin.tajalli@utah.edu) [icas.ece.utah.edu]

*Figure from <https://incompliancemag.com/article/circuit-theory-model-of-ringing-on-a-transmission-line/>