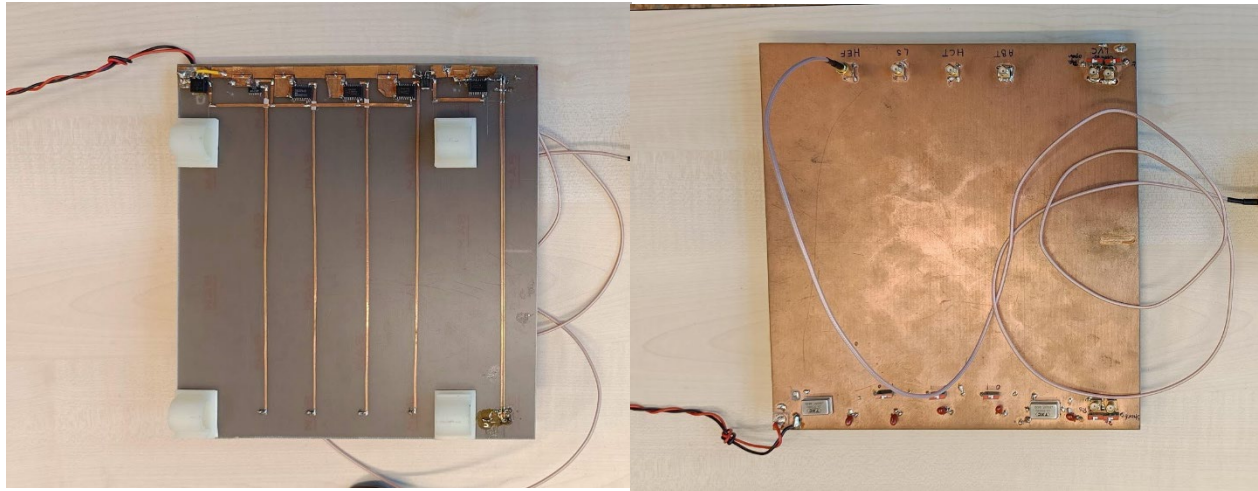


# EMC Demo board design: Spectra of Logic Families

## Bachelor thesis project



### Summary:

In digital electronics, binary code is being transmitted and can be used to perform various operations for instance through different logic gates. The signals that are generated are squarewave shaped, and have to travel over PCB traces. The design of the traces, choices of termination and speed of the signals determine the spectra that generated. Which eventually can interfere on other circuits.

### Problem definition:

Signal corruption can occur due to ringing from reflections, which can also effect other “isolated” circuits due to crosstalk.

### Method:

Analysis and explanation of design choices and parameters need to be provided for avoiding these effects. This can be done through simulation models, for instance by performing a signal integrity analysis. Results should also be compared in both time and frequency domain. The investigation should cover different logical families in combination with a PCB design implementation.

### Research objectives:

Simulation and design of a PCB with diffent logic families, analyzing the key parameters and their correlation with EMI being generated.

### Courses and supervision:

No specific courses are needed as a background. A good affinity with Matlab and PCB design software is very beneficial for doing this assignment.

### Contact:

Dr. ir. Niek Moonen, [niek.moonen@utwente.nl](mailto:niek.moonen@utwente.nl)

University of Twente.