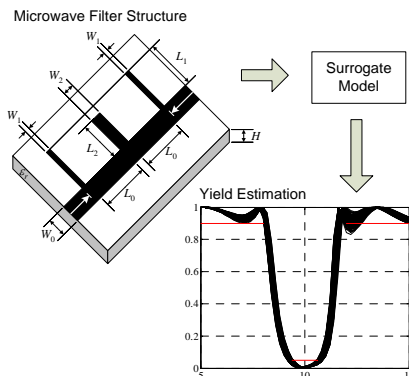
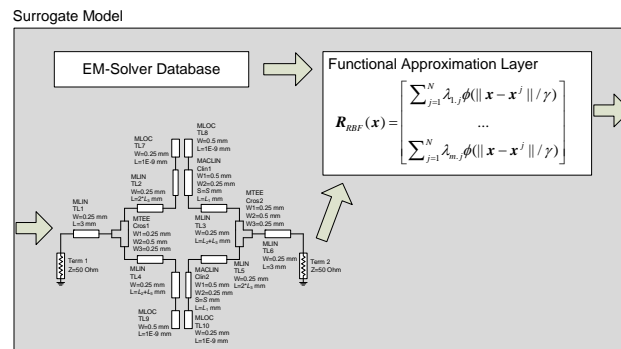
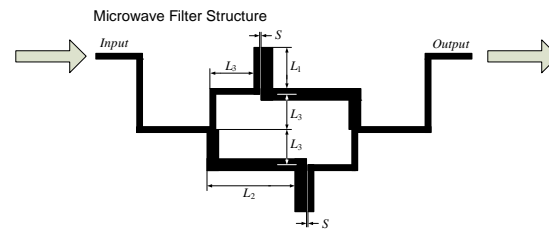


Computationally Efficient Modeling Techniques for Statistical Analysis and Design Optimization of Microwave Devices

Supervisor: Slawomir Koziel

This research-oriented project aims at the development of computationally efficient models of microwave devices. Statistical analysis and yield optimization, crucial for manufacturability-driven designs in a time-to-market development environment, demand accurate and fast models. Full-wave electromagnetic (EM) simulations of microwave structures offer accuracy at the cost of CPU effort. High CPU cost is undesirable from the point of view of direct statistical analysis and design, particularly a parametric optimization of the microwave structure geometry.

The main goal of the project is the development of surrogate modeling techniques that would provide models of microwave structures that are both computationally cheap and accurate so that they can be used for the design tasks requiring massive evaluations of the model.



The approach used in this project will be space mapping combined with suitable functional approximation techniques, for example, low-order polynomials and radial basis functions.

The project will involve working with the design of experiments methods as well as physical and functional approximation techniques, experiments using commercial electromagnetic solvers and circuit simulators (CST Microwave Studio, Sonnet *em*, FEKO, Agilent ADS), and programming in Matlab.