In this talk, the use of variable-fidelity electromagnetic simulations for reduced-cost modeling and optimization of microwave structures is discussed. We present various strategies for setting up surrogate models based on coarse-discretization EM simulations (referred to as low-fidelity model), including space mapping, shape-preserving response prediction, and adaptive response correction. Expedited design optimization using such surrogates and appropriate correction-prediction schemes will be demonstrated through a number of examples concerning various filter and antenna structures. Application of variable-fidelity EM simulations for low-cost quasi-global microwave modeling will also be covered. Part of the talk will be devoted to discuss tailoring „standard” surrogate-based methods for solving more demanding design cases involving array antennas, compact microwave structures and integrated photonic devices.

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