



Contribution ID: 153

Type: **not specified**

## **D-Optimal Experiment Design for Nested Sensor Placement**

*Tuesday, 12 September 2023 08:30 (20 minutes)*

Internet of Things sensors placed in the environment may be subject to a nested structure caused by local data relay devices. We present an algorithm for D-optimal experiment design of the sensor placement under these circumstances. This algorithm is an adaption of an existing exchange algorithm sometimes called the Fedorov algorithm. The Fedorov exchange algorithm has been shown in the literature to perform well in finding good designs with respect to the D-optimality criterion. Our adaption of the algorithm is designed for the special case of a two-level nesting structure imposed upon the potential design points of a linear model. The adapted algorithm shows effective identification of a known optimal design in simulated cases and also appears to converge on a design(s) for further simulated datasets and an application dataset, where the optimal design(s) is unknown.

### **Keywords**

Internet of Things, Fedorov, nesting

### **Classification**

Both methodology and application

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**Session Classification:** CONTRIBUTED Design of Experiments 2

**Track Classification:** Design and analysis of experiments