Justin Gray
OpenMDAO Development Team Lead
NASA Glenn Research Center

"OpenMDAO: Efficient Multidisciplinary Optimization with Analytic Derivatives"
Monday, November 27, 2017
1:00 pm - 1:50 pm, Pepper Canyon Hall, Room 122

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Abstract

Each new generation of engineered systems must outperform the one that came before it. Sometimes performance gains can be had via the improvement of a single component or sub-system. Often, however, the largest gains can be achieved when multiple subsystems are designed synergistically via a multidisciplinary process. While the performance potential of multidisciplinary design is great, multidisciplinary problems tend to have large design spaces (from 10's to 1000's of design variables). Gradient based optimization with analytic derivatives is one of the most efficient methods for tackling large design spaces, but for large coupled problems the implementation of this technique can be especially challenging. NASA has developed an open-source framework, OpenMDAO, that greatly simplifies the application of gradient based optimization with analytic derivatives. This talk will discuss the basics of OpenMDAO and cover several relevant example application in cube satellite design, wind farm layout, and boundary layer ingestion aircraft propulsion.

Biography

Justin Gray has worked at the NASA Glenn Research Center in Cleveland OH for 14 years. He is a member of the Propulsion Systems Analysis Branch with an expertise in

turbine engine cycle analysis and Multidisciplinary Design Analysis and Optimization. He received his BS in Aerospace engineering from Georgia Tech and MS in computer science from Case Western Reserve University. He is currently working toward a PhD in Aerospace engineering at the University of Michigan in the MDO lab under Professor Joaquim Martins.

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