

# Introductory Course: Using LS-OPT® on the TRACC Cluster

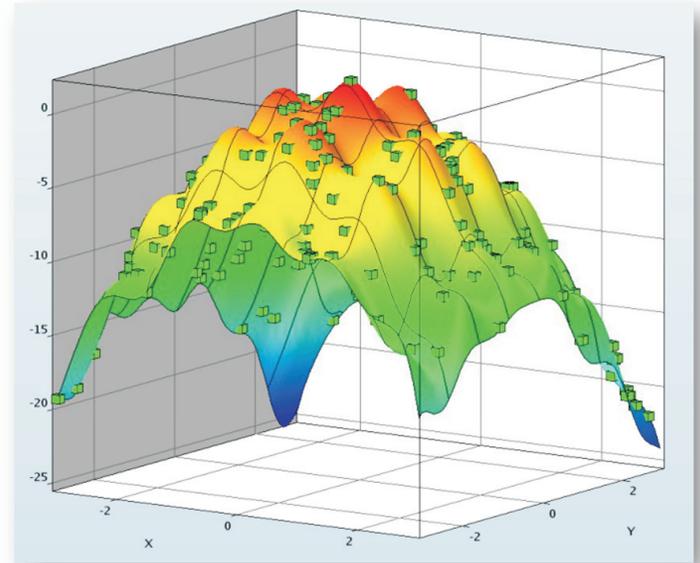
January 20-21 2010  
West Chicago, Illinois

The US Department of Transportation funded Transportation Research and Analysis Computing Center at Argonne National Laboratory will hold training courses on (1) the multipurpose optimization software LS-OPT and (2) on how to use the code on the TRACC High Performance Cluster.

LS-OPT is the optimization tool that allows the user, through the graphical interface, to structure the design process, explore the design space and compute optimal designs according to specified constraints and objectives. The program is also highly suited to the solution of system identification problems and stochastic analysis, including probabilistic analysis. LS-OPT interfaces perfectly with LS-DYNA but can also be used with other software and user defined solvers.

The LS-OPT Introductory Course is intended primarily for finite element analysts who have prior basic knowledge of the LS-DYNA software package. The class will provide the analyst with the introduction to Metamodel Based Design Optimization, stochastic analysis (probabilistic analysis) and Reliability Based Design Optimization (RBDO) within LS-OPT software. The typical attendee should have a background that includes a working knowledge of finite element analysis techniques, use of other nonlinear finite element software, and experience in modeling nonlinear events. Optimization knowledge is not required.

Since the LS-OPT software is new to the attendees, the course explains the basic ideas and focuses on step-by-step preparation of the input deck and extraction of the results under LS-OPT User Interface. All introduced concepts and techniques will be illustrated with simple examples. Presentation material and example input files together with reduced result files will be available to attendees for prior download to ease the interaction during the course. The cluster users class will present specifics on how to use LS-OPT and LS-DYNA on the TRACC high performance cluster.



## Instructors

The course will be given entirely by TRACC staff. The use of LS-OPT for different design optimization methodologies will be presented by Dr. Cezary Bojanowski. Introduction to probabilistic analysis will be presented by Dr. Ronald Kulak. Theoretical background to constrained and unconstrained optimization will be introduced by Dr. Vadim Sokolov. Presentation on best practices on TRACC cluster will be given by Dr. Hubert Ley.

## Location

The training course will be held at the DuPage Airport Flight Center in West Chicago where Argonne's TRACC offices are located. The training sessions will be held on the third floor of the flight center. The training sessions will also be broadcast over the Internet. The link to the Adobe Connect session will be provided to registered participants.

## Registration

Participation in the training course is free. Travel, lodgings, and other expenses are the responsibility of the participant. Please contact us at the number or E-mail address shown below if you would like to attend the training sessions either by Internet or in person.

## Contact Information

Dr. Ronald F. Kulak  
Argonne TRACC  
2700 International Drive, Suite 201  
West Chicago, IL 60185  
630 578 4245  
kulak@anl.gov  
www.tracc.anl.gov

# LS-OPT® Introductory Course

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## Administrative Introductions

- Training for use of LS-OPT on the TRACC cluster will be presented over two days.
- Sessions will start at 9:30 AM (CST) and end at 4:30 PM. Lunch break will be from 12:30 PM till 1:30 PM.
- Time between 3:00 PM and 4:30 PM will be intended for individual work on example problems.
- There will be a 20 minute Break in the mornings and afternoons.
- Audience participation is encouraged to maximize learning.

### Day 1 - January 20, 2010 9:30 AM-4:30 PM (CST)

1. Welcome Remarks by Edward Daniels, Director, Energy Systems Division
2. Introduction to Response Surface Methodology
3. Optimization Theory
4. Introduction to LS-OPT Graphical User Interface
5. Running LS-OPT on TRACC Cluster
6. Metamodel Based Design Optimization

### Day 2 - January 21, 2010 9:30 AM-4:30 PM (CST)

1. Best Practices on TRACC Cluster
2. User Defined Solver – Perl and OCTAVE
3. System Parameter Identification
4. Probabilistic Analysis
5. Reliability Based Design Optimization

#### Hotel: Pheasant Run Resort

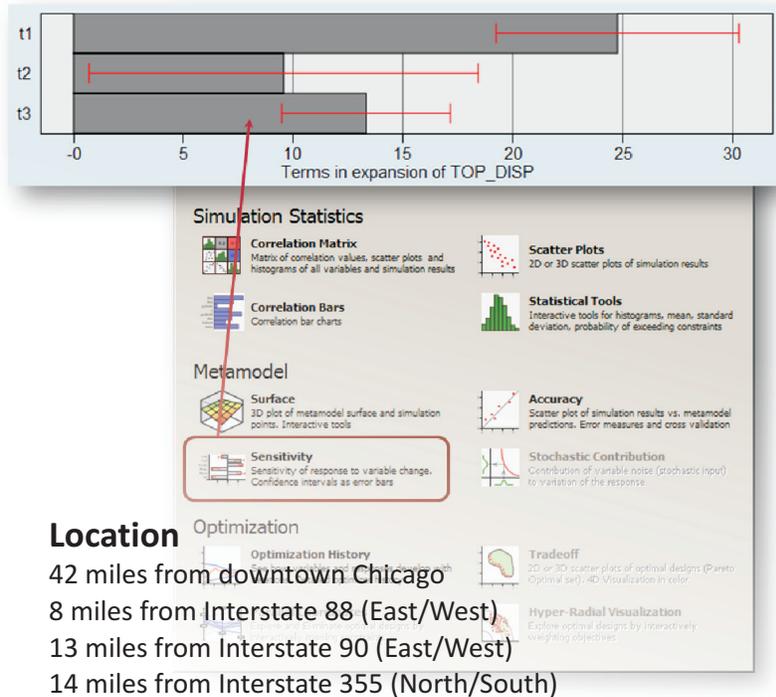
[www.pheasantrun.com](http://www.pheasantrun.com)  
4051 E Main Street, St. Charles, IL 60174  
Reservations: 1-800-474-3272  
Direct Telephone: (630) 524-5042  
Fax: (630) 584-9831  
Email: [jfreeman@pheasantrun.com](mailto:jfreeman@pheasantrun.com)  
Rate: \$106.00/night

#### Hotel: Comfort Inn & Suites

[www.comfortinngeneva.com](http://www.comfortinngeneva.com)  
1555 E Fabyan Parkway, Geneva, IL 60134  
Reservations: 1-877-424-6423  
Direct Telephone: (630) 208-8811  
Fax: (630) 208-7844  
Email: [sales@ComfortInnGeneva.com](mailto:sales@ComfortInnGeneva.com)  
Rate: \$72.00/night

#### Hotel: Country Inn & Suites

[www.countryinns.com/stcharlesil](http://www.countryinns.com/stcharlesil)  
155 38th Avenue, St. Charles IL 60174  
Reservations: 1-800-596-2375  
Direct Telephone: (630) 587-6564  
Fax: (630) 587-6568  
Email: [cx\\_schl@countryinns.com](mailto:cx_schl@countryinns.com)  
Rate: \$99.95/night



## Directions

### From I-88 (Coming from the East or West)

To Farnsworth/Kirk Rd: Going North  
To 38/ Roosevelt Rd: Going East  
To Kautz Rd: Turn Left  
To International Drive: Turn Right

### From I-90/ Northwest Tollway (Coming from either direction)

To Route 59: Going South  
To 64/ North Ave: Going West  
To Kautz Rd: Turn Left  
To International Drive: Turn Left

### From I-355/ North-South Tollway (Coming from the South)

To 38/ Roosevelt Rd: Going West  
To Kautz Rd: Turn Right  
To International Drive: Turn Right

### From I-355/ North-South Tollway (Coming from the North)

To 64/ North Ave: Going West  
To Kautz Rd: Turn Left