4th Optimization & Stochastic Days India 2014

September 18–19, 2014
Hotel Park Plaza, Bangalore
THANK YOU FOR COMING!
# Introduction

## CADFEM
**FEM Software & Services**
- 30+ years experience
- 200+ employees
- €60 Mio. revenue
- Central Europe: 12 offices
- Privately owned
- Worldwide through partners & TechNet Alliance
- CADFEM Innovative
- Certification: ISO 9000

## ANSYS
**Competence Center FEM**
- ANSYS Channel Partner in Central Europe since 1982
- 50+ different seminar topics
- 100+ ANSYS technical & sales engineers

## CADFEM
**Complementary Software**
- Explicit analysis
  AUTODYN and LS-DYNA
- Metal forming
  FTI, eta
- Robust analysis
  optiSLang
- Materials
  ESAComp, DIGIMAT, MaterialStudio
- Acoustics
  WAON

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Software – Seminars – Support – Consulting - Development
**Profile**

- Established in 2007 – located in Hyderabad and Bangalore (home-office).
- Division of CADFEM International AG, Suisse
- 11 engineers & 2 admin. assistants
- Engineers are highly qualified and experienced in FEM / CFD

**FEM Software and Services**

- **ANSYS**: Consulting, calendar courses on many topics
- **LS-DYNA**: Finite element program for nonlinear explicit dynamics
- **optiSLang**: Tool for optimization / robustness / reliability
- **TESIS DYNAware**: Engine dynamics and vehicle dynamics
- **ESAComp THE SOFTWARE**: Object oriented development framework for the solution of PDEs
- **Diffpack**: Simulation environment for automobile paint process

**Expertise**

- Statics / Dynamics
- Strength Assessment Fatigue Analysis
- Drop Test, Impact
- Passenger & Pedestrian Safety
- Seat Design
- Meshless Methods (SPH)
- CFD
- Materials / Composites
- Robust Design Optimization
- Numerical Programming
Design optimization is employed during simulations to achieve various goals such as to reduce weight or deformation, maximizing efficiency of a system, ....

This allows reduced cost of the product and helps to promote increased profitability to organizations.

Naturally occurring scatter or variation in the design parameters can result in unwanted scatter in the response parameters. This can lead to failure or push critical response parameters beyond permissible limits, thereby affecting the product performance.

How do we design products that are not only optimized for performance, but also safe and reliable?
11th Annual Weimar Optimization and Stochastic Days 2014
Conference for CAE-based parametric optimization, stochastic analysis and Robust Design Optimization (RDO).
4th Optimization & Stochastic Days
Workshop on Robust Design Optimization

September 18-19, 2014

Regional Conference
Park Plaza, Bangalore

Pune
April 2010

14 participants
8 organizations
4 industries

One-Day Seminar on Robust Design

Bangalore
December 2011

35 participants
23 organizations
8 industries

1st Optimization & Stochastic Days

Pune
December 2012

23 participants
18 organizations
4 industries

2nd Optimization & Stochastic Days

Bangalore
September 2013

17 participants
13 organizations
5 industries

3rd Optimization & Stochastic Days
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00</td>
<td>Registrations</td>
</tr>
<tr>
<td>9:50</td>
<td>Welcome by CADFEM</td>
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<tr>
<td>10:00</td>
<td><strong>KEYNOTE: Robust Design Optimization – Overview!!</strong> By Dr. Johannes Will, Dynardo GmbH</td>
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<td>10:50</td>
<td>Coffee break</td>
</tr>
<tr>
<td>11:30</td>
<td><strong>Investigation of interface delamination in molded power modules</strong> By Arjun Yadur, Robert Bosch Engineering and Business Solutions Limited</td>
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<tr>
<td>12:05</td>
<td><strong>Explore and optimize filter element using OptiSLang</strong> By Revanth Krishna Nallam &amp; Nagendra Prasad, MANN AND HUMMEL FILTER PRIVATE LIMITED</td>
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<tr>
<td>12:40</td>
<td><strong>Robust Design Optimization: CFD Applications</strong> By Dr. Johannes Will, Dynardo GmbH</td>
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<tr>
<td>13:25</td>
<td>Lunch Break</td>
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<tr>
<td>14:30</td>
<td><strong>Training: Design Exploration, Parametric Optimization &amp; Process Automation</strong></td>
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<tr>
<td></td>
<td>Instructor(s): Karthik Chittepu (CADFEM) &amp; Dr.-Ing Johannes Will (Dynardo)</td>
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<tr>
<td></td>
<td><strong>Topics covered</strong> (with several practical examples)</td>
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<tr>
<td></td>
<td>1) Design of Experiments/Sensitivity Analysis</td>
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<td></td>
<td>2) Multi-Disciplinary/Multi-Objective Optimization</td>
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<td></td>
<td>3) Integration with CAE Solvers</td>
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<td></td>
<td>4) Q&amp;A Session – Discuss your own problems!</td>
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<tr>
<td>17:30</td>
<td>Closing remarks for the day</td>
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</tbody>
</table>
### Agenda

**Day 2**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>9:30</td>
<td><em>Opening remarks for the day</em></td>
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<tr>
<td>9:40</td>
<td><strong>CAE-based robustness evaluation in virtual prototyping – luxury or necessity</strong></td>
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<tr>
<td></td>
<td>by Dr. Johannes Will, Dynardo GmbH</td>
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<tr>
<td>11:10</td>
<td><em>Coffee break</em></td>
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<tr>
<td>11:45</td>
<td><strong>Brake Squeal: A Challenge</strong></td>
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<tr>
<td></td>
<td>by Karthik Chittepu, CADFEM India</td>
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<tr>
<td>12:20</td>
<td><strong>Adaptive Response Surface based FE Model Updating for Operational Modal Analysis of RC Road Bridge</strong></td>
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<td></td>
<td>by Amit Rathi &amp; Dr. Arunasis Chakraborty, Indian Institute of Technology, Guwahatii</td>
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<tr>
<td>12:55</td>
<td><strong>Design of Experiments and response surface method to Optimize Impact Parameters</strong></td>
</tr>
<tr>
<td></td>
<td>by Badari N Kantheti, UTAS</td>
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<tr>
<td>13:30</td>
<td><em>Lunch Break</em></td>
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<tr>
<td>14:30</td>
<td><strong>Training: Robustness Analysis, Robust Design Optimization &amp; Reliability Analysis</strong></td>
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<tr>
<td></td>
<td>Instructor(s): Karthik Chittepu (CADFEM) &amp; Dr.-Ing Johannes Will (Dynardo)</td>
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<td><em>Closing remarks for the day</em></td>
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**Speaker Biography**

Dr.-Ing. Johannes Will  
Founder & CEO, Dynardo GmbH

**Academic Qualifications**
- Studied Civil Engineering in Weimar (Germany) and Seattle (USA)  
- Ph.D. in structural mechanics at Bauhaus University in Weimar

**Professional Experience:**
- Started professional career at CADFEM; head of consulting force in Grafing, Germany  
- One of the principal scientists & principal consultant for RDO applications since 2003  
- Ran industrial integration and consultancy projects of robustness evaluation since 2003 at automotive industry for NVH applications, passive safety, crashworthiness, brake squeal analysis  
- Ran industrial integration project of RDO applications at automotive, energy, consumer goods applications
Speaker Biography

Arjun Yadur
Associate Project Manager, Robert Bosch Engineering and Business Solutions Ltd.

Academic Qualifications

- B.E. (Mechanical Engineering) at Malnad College of Engineering, Hassan

Professional Experience:

- 9 years of experience in CAE/Simulation-Based Product Development
- Previously worked for Wipro for 3 years
- Core competence in thermal & thermo mechanical failures in molded power modules
- Worked on NVH for ECU’s and Power Trains
Revanth Krishna Nallam
Senior CFD engineer, MANN AND HUMMEL FILTER PRIVATE LIMITED.

Academic Qualifications
- M.Tech. (Specialization Computational Fluid Dynamics) at IIIT Pune

Professional Experience:
- 6 years of experience in CFD domain.
- Previously worked for Mechartes Researchers Pvt Ltd for 2 years and worked for GE technology center for 2 years
- Overall Experience includes wide variety of CFD problems in the area of HVAC, Power and Automobile using optiSLang and ANSYS tools like CFX, ICEM, Space claim, DX.
- Six Sigma Green belt certified from GE.
- Good expertise in fluid flow analysis, Fire simulations and also in six sigma methods.
Karthik Chittepu
Team Leader – CAE Department, CADFEM India

**Academic Qualifications**
- B.E. in Civil Engineering from Osmania University, India
- M.Sc. in Computational Engineering from Technische Universität München

**Professional Experience:**
- Intern at Daimler GmbH; Masters thesis in robustness analysis of brake squeal
- Started professional career at Dynardo GmbH as optimization & stochastic analysis intern
- Joined CADFEM India as a specialist in optimization & statistical analysis since 2008
- Overall Experience includes wide variety of structural problem in home appliance, automobile and watch industry
- Ran industrial integrated projects of RDO applications in automotive industry
Amit Rathi
Research Scholar, IIT Guwahati

Academic Qualifications
- B.E. (Civil) at Periyar University
- M.Tech. (Structural) at IIT Guwahati, Assam

Professional Experience:
- Research Scholar at IIT Guwahati, Assam
- Core competence in structural FEA modelling, Reliability based design, Meta-model based optimization
Dr. Badari N Kantheti
R&D Specialist, UTAS

Academic Qualifications
- Ph.D. in Fatigue and Fracture, Indian Institute of Sciences Bangalore, 1989
- B.Tech. in Mechanical Engineering, Indian Institute of Sciences Bangalore, 1983

Professional Experience:
- Above 30 years of experience in aerospace industry including IISC, ISRO, TCS and UTC aerospace
- Was awarded Innovation of the year 2012, Goodrich Aerospace Services (P) Ltd., Bangalore, India
- NDT award from National Governing Council of NDT – Chennai, 2009
- He obtained a number of academic awards and honours, including a Gold medal
- He has over 90 Int. and national journal and conference publications to his credit