

Välkommen till

Andra Seminariet

Optimization Competence Arena



Optimization Competence Arena





Optimization Competence Arena

A cross-functional arena for competence development around product optimization.

Purpose

- Develop competence, processes, methods and tools for optimization driven development
- Share Competence and Knowledge
- Strengthen Swedish industry and academia

Today, there is no equivalent forum in Sweden with this focus, consequently this arena is unique.

Arena homepage



Projects

- Finished, ongoing and upcoming
 - Master Thesis
 - Research

Seminars

- Agenda and presentations
- Pictures

Results and Links

- Project reports and documents

Contacts and Network

CHALMERS Education Research Areas of Advance About Chalmers

Start > Departments > Product and production development > Centres/Collaborations > Optimization Competence Arena

Product and production development

- News
- Calendar
- Education +
- Research +
- Society and Industry
- Centres/Collaborations -
- Squeak & Rattle Competence Arena +
- Optimization Competence Arena
- Guests
- Organization +
- Contact

Optimization Competence Arena

The purpose with the Optimization Competence Arena is to develop competence, methods, tools and processes for optimization driven development in order to strengthen Swedish industry and academia within this area.

Volvo Car Group and Chalmers University of Technology are the initiators of the Optimization Competence Arena. Today, there is no equivalent forum in Sweden with this focus, consequently this arena is unique. Product optimization is a multi-disciplinary area which influences several industrial and academic fields. Future industrial sustainability challenges will also demand more efficient methods. These are the main drivers to create a cross-functional forum for competence development around product optimization.

Contact us

For more information, please contact:
Magnus Bengtsson,
magnus.bengtsson@chalmers.se

CONTACT PAGE RESPONSIBLE

Published: Mon 27 Jun 2016. Modified: Tue 01 Nov 2016

AGENDA

09:30-10:00 Mingel med Kaffe och fralla

10.00-10:10 Introduktion

Presentationer från företag. Två block. MDO och CFD.

10:10-11:10 MDO

- Petter Andersson, GKN Aerospace: *“Set based, multi disciplinary optimization for concept design”*
- Mikael Törmänen, Volvo Cars: *“Integrating MDO into the Product Development Process”*
- Johnny Engström, CEVT: *“Optimization of Powertrain Installation”*

11:10-11:20 Bensträckare

11:20-12:00 CFD

- Fredrik Edelvik, Fraunhofer: *“Automatiserad CFD simulering med inbäddade randmetoder”*
- Aris Babajimopoulos, Volvo Cars: *“Activities in the area of CFD optimization within VCC”*

12:00-12:15 Sammanfattning och paneldiskussion

12.15-13:00 Lunch

13:00-13:15 Information om avsiktsförklaring

13:00-14:00 Akademin, kompetens, forskning och utbildning inom MDO och CFD-optimering

14.00-14:15 Presentation av kommande examensarbeten

14:15-14:30 Summering av dagen och nästa steg



Speakers

MDO

Petter Andersson, GKN Aerospace

“Set based, multi disciplinary optimization for concept design”



Mikael Törmänen, Volvo Cars

“Integrating MDO into the Product Development Process”



Johnny Engström och Lucas Börjesson, CEVT

“Optimization of Powertrain Installation”



CFD

Fredrik Edelvik, Fraunhofer

“Automatiserad CFD simulering med inbäddade randmetoder”



Aris Babajimopoulos, Volvo Cars

“Activities in the area of CFD optimization within VCC”





Sammanfattning och paneldiskussion

AGENDA

09:30-10:00 Mingel med Kaffe och fralla

10.00-10:10 Introduktion

Presentationer från företag. Två block. MDO och CFD.

10:10-11:10 MDO

- Petter Andersson, GKN Aerospace: *“Set based, multi disciplinary optimization for concept design”*
- Mikael Törmänen, Volvo Cars: *“Integrating MDO into the Product Development Process”*
- Johnny Engström, CEVT: *“Optimization of Powertrain Installation”*

11:10-11:20 Bensträckare

11:20-12:00 CFD

- Fredrik Edelvik, Fraunhofer: *“Automatiserad CFD simulering med inbäddade randmetoder”*
- Aris Babajimopoulos, Volvo Cars: *“Activities in the area of CFD optimization within VCC”*

12:00-12:15 Sammanfattning och paneldiskussion

12.15-13:00 Lunch

13:00-13:15 Information om avsiktsförklaring

13:00-14:00 Akademin, kompetens, forskning och utbildning inom MDO och CFD-optimering

14.00-14:15 Presentation av kommande examensarbeten

14:15-14:30 Summering av dagen och nästa steg



Avsiktsförklaring




“...promote development of processes, methods and tools for product optimization in order to enhance Swedish industry and academia.”

“...not a development project, development projects within the area of or connected to the competence arena shall be regulated separately.”

Primärt syfte:

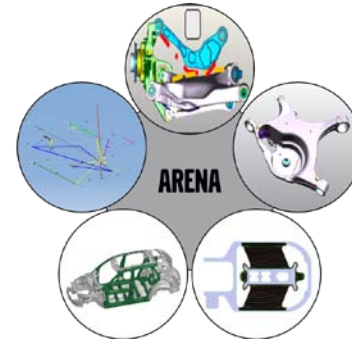
- Formalisera arenan
- Skapa styrgrupp

	Optimization Competence Arena	Optimization Competence Arena										
<p data-bbox="575 560 852 620">Statement of Declaration regarding formation of Optimization Competence Arena</p> 	<p data-bbox="1000 529 1058 540">Background</p> <p data-bbox="1000 546 1323 606">Vovvo Car Group and Chalmers University of Technology are the initiators of the Optimization Competence Arena. Chalmers University of Technology is host for the competence arena in order to bring a more academic nature to the arena. Today, there is no equivalent forum in Sweden that focuses on optimization driven development, consequently this arena will be unique. Product optimization is a multi-disciplinary simulation area with influence from several (industrial and academic) fields. This is one of the main drivers to create a cross-functional forum for competence development.</p> <p data-bbox="1000 622 1213 633">Agreement for Optimization Competence Arena</p> <ol data-bbox="1014 638 1323 966" style="list-style-type: none">1. The purpose with the competence arena is to promote development of processes, methods and tools for product optimization in order to enhance Swedish industry and academia within the area. The competence arena is not a development project, development projects within the area of or connected to the competence arena shall be regulated separately.2. The competence arena consists of members with diverse competence background from industry and academia in order to create a wide knowledge base.3. Each member of the competence arena shall be represented by one person that belongs to a steering group.4. Members intend to share knowledge and experience with each other in order to develop the area and to define projects that are distributed in accordance with the mutual agreement of all members.5. Respective members contribute to the development of the competence arena by invited time and sharing of equipment or facilities for defined projects. Each member decides on the extent of their own contribution.6. The competence arena shall have a number of meetings (tentatively twice) each year in order to present progress and plan future activities. During those meetings, respective members are expected to contribute with seminars, demonstrations of simulation cases, review of ongoing projects, presentation of new issues or ideas, etc. No reimbursement of expenses will be made to the members unless otherwise agreed. No member shall be bound to any financial commitments of the steering group or other member, unless such commitment has been agreed in writing.7. Chalmers is host for the competence arena and finances administration and website in accordance with Chalmers regulations.8. All members acknowledge that the provision of the hosting is done in the framework of Chalmers University of Technology's business projects.9. The competence arena is placed within the Department of Product and Production Development.10. The competence arena will contribute a platform to facilitate the members to create partnerships under specific arrangements with external financing.11. The arena is not a legal entity, each party shall determine its involvement.12. Decisions are made by majority vote when required.13. Conviction of additional members shall be decided unanimously.	<ol data-bbox="1439 529 1748 720" style="list-style-type: none">14. Members shall endeavour to provide results that originate from the activities of the competence arena such as thesis reports and scientific papers on the competence arena's website.15. After Chalmers' approval, members may publish results and information on the competence arena's website. Member may not publish other parties' information without the prior specific approval from that party, in the case of joint developed results or information, publication on the arena website requires prior approval from contributing members.16. Members shall ensure adequate regulation of rights and to question and enter co-authors in accordance with good practice.17. This agreement does not provide the members with product descriptive data such as CAD models, simulation models, requirements or provision of license for proprietary software or technology etc. without agreement made in each individual case.18. No annual fee is required from members in the competence arena.19. The parties agree that all projects shall be governed by specific written agreements.20. The declared intention from each member is based on the prerequisite that a formal Agreement will be drafted, regulating the Parties obligations, how results will be owned, published, and how IP rights should be owned along with other relevant regulation.21. This Statement of Declaration shall be valid for half (1/2) years from last signature. Any party may withdraw from the Arena by notification to the Steering Group. <p data-bbox="1429 737 1487 748">Participants</p> <p data-bbox="1429 753 1748 769">The following stakeholders do here by declare their intention to form a scientific arena in accordance to this agreement.</p> <table data-bbox="1429 791 1748 889"><tr><td data-bbox="1429 791 1555 835">Chalmers University of Technology Håkan Sjöström Director Product and Production Development</td><td data-bbox="1574 791 1709 835">Vovvo Car Group Sören Erik Svensson Vice President, Research and Development</td></tr><tr><td>_____</td><td>_____</td></tr><tr><td>Name and Place</td><td>Name and Place</td></tr><tr><td>_____</td><td>_____</td></tr><tr><td>Signature</td><td>Signature</td></tr></table> <p data-bbox="1429 917 1574 955">AB Vovvo Olof Eriksson Senior Vice President, Research & Innovation Policy</p> <p data-bbox="1574 917 1709 955">SCANIA TBD Position</p>	Chalmers University of Technology Håkan Sjöström Director Product and Production Development	Vovvo Car Group Sören Erik Svensson Vice President, Research and Development	_____	_____	Name and Place	Name and Place	_____	_____	Signature	Signature
Chalmers University of Technology Håkan Sjöström Director Product and Production Development	Vovvo Car Group Sören Erik Svensson Vice President, Research and Development											
_____	_____											
Name and Place	Name and Place											
_____	_____											
Signature	Signature											
	2	3										

Examensarbeten



Vi genomförde sju (5 på vcc + 2 på scania) exjobb i våras.
Se info på hemsidan.



Följande 4 exjobb avser vi på VCC driva under 2017.

- *Organisation development - Structural Optimization*
- *Cast simulation and manufacturing constraints for detailed part optimization*
- *Structural Optimization of Base Engine component*
- *One sided screw joints for Chassis Systems*

Se info på hemsidan inom kort.

Examensarbeten



Mikael Thellner
Technical Manager



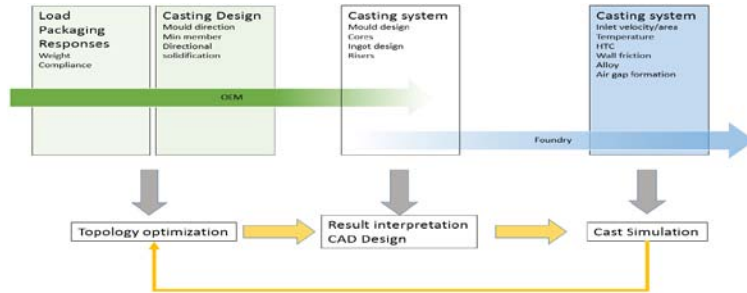
- *Topologioptimering av skruvförband*
- *Weight optimization of chassi*
- *Multidisciplinär optimering av spant för busskaross med hjälp av helautomatiskt genererad lastbärande stomme i Catia*
- *Design for AM*
- *Fatigue life investigation of flexible hoses*

Optimization of Cast Components

Diariennr: 2016-04341



Introduce casting simulation in the topology optimization process for cast components and secure in-house competence at Volvo Cars.



Partners

swerea | SWECAST



NOVACAST



Leader



Anders Gotte
Swerea
Coordinator



Harald Hasselblad
Volvo Cars

swerea | SWECAST

"...välutrustade laboratorier och ett prototyp- och försöks-gjuteri ...
tex additiv tillverkning av formar och kärnor i sand."

"...har nu tillgång till 3D-skrivare för både metall, keram och plast."

S-Max Tech Specs sandprinter från ExOne för gjutformar och kärnor

"Vi kan t.ex. optimera geometrin utifrån funktionen eller vald tillverkning.
För att göra detta använder vi virtuella metoder och vårt kunnande."



"Can simulate most commercial casting methods"
"Casting materials possible to simulate is Gray- and Ductile iron, Steel alloys, Aluminum alloys, Copper-, Zinc and Magnesium-based alloys, Super alloys like nickel and chrome based and Titanium."
"Casting defects can be avoided by optimizing the design of the gating and feeding system."



NOVAFLOW
& SOLID 6.0

Nästa steg

- Summering av seminarium
- Hemsida etc.
- Identifiera och initiera intressegrupper
 - MDO
 - Topology Opt.
 - Composite opt.
 - CFD
 - ...
- PhD network?
- Starta upp examensarbeten våren 2017
- Samarbete med finansiärer
 - Information om utlysningar
- Seminarium våren 2017
 - Förslag på tema?
 - Guest speaker?
 - Engelska?



TACK!



Fredrik Edelvik



Disputerade 2002 i beräkningsteknik vid Uppsala universitet och blev 2006 docent vid samma universitet. Jobbar sedan 2005 vid Fraunhofer-Chalmers Centrum för Industrimatematik som vice föreståndare och avdelningschef för beräkningsteknik. Avdelningen har 18 anställda och utför forskning inom modellering, simulering och optimering för virtuell produkt och processutveckling. Grundade 2014 IPS IBOFlow AB som ett spin-off företag från FCC.

Mikael Törmänen



Dr M. Törmänen finished his Ph.D. in Vehicle Engineering in 2001 at the department of Machine and Vehicle Systems at Chalmers University of Technology. He has joined Volvo Car Corporation in 2005 to work with powertrain simulations with focus on the longitudinal vehicle dynamics, i.e. driveability. Since the attribute driveability is influenced by almost every mechanical systems in the front-end of the vehicle he has gained a broad overall system knowledge and experience in different customer attributes that need to be optimized. To improve the optimization between several attributes he has formed a CAE framework that makes it possible to reuse and speed up the optimization process. This has been applied successfully on engine mount systems which has a major impact on driveability.

Aris Babajimopoulos



Dr. Aris Babajimopoulos is a Senior CAE Engineer at Engine Engineering and is currently working on CFD analysis of the gasoline and diesel combustion systems. His responsibilities include intake port design, diesel piston shape design, spray targeting, and combustion analysis in general. Dr. Babajimopoulos joined VCC 3.5 years ago, after spending 14 years in academia. Before joining VCC, he had been research scientist at the University of Michigan, Ann Arbor, and assistant professor at the State University of New York, Stony Brook.

Johnny Engström



Senior Manager Chassis & Powertrain CAE, CEVT, since 2015. He joined CEVT with a vision to shorten development time by expanding the use of design exploration across attributes. Before joining CEVT, since 1992, his background has been in multibody simulations in the vehicle dynamics, control systems and powertrain dynamics, and optimization, from technical and managerial positions held at Volvo Car, Mechanical Dynamics, MSC Software, CAE Value and Red Cedar Technology.

Lucas Börjesson

CEVT



CAE Engineer, Chassis & Powertrain CAE, CEVT, since 2014. Lucas is responsible for the multi-objective domain optimization (MDO) environment at CEVT, and has been instrumental in deploying MDO method and process within the CEVT organization in the field of powertrain mount design to achieve suitable balance across attributes such as Ride, Driveability, Fatigue, Strength, and NVH

Petter Andersson



Technology lead for multi-disciplinary optimization at R&T, GKN Aerospace.

Background in Knowledge Based Engineering and design automation.

Ph.D. in Functional Product Development @ Luleå University of Technology