Admos 2023
Technical Programme

Monday, 19/06/2023

Mon, 19/06/2023 12:00 - 14:00
R-01MM - Registration

Mon, 19/06/2023 12:30 - 14:00
WL-01MM - Lunch

Mon, 19/06/2023 14:00 - 14:45   Runan Auditorium
O-01MA - Opening

Mon, 19/06/2023 14:45 - 15:30   Runan Auditorium
PL-01MA. - PL-I-Suzanne Shontz
High-Order Mesh Generation and Warping for Biomedical Simulations
Chaired by: Prof. Kenneth Runesson (Chalmers Univ of Technology)

Mon, 19/06/2023 15:30 - 16:00
CB-01MA - Coffee Break

Mon, 19/06/2023 16:00 - 18:00   Runan Auditorium
MS01-01MA. - MS01 Recent Developments in Methods and Applications for Mesh Adaptation
Chaired by: Prof. Suzanne Shontz (University of Kansas)

A hybrid adaptive method for initial-boundary value problems
K. Mattsson*, T. Ahn Dao, G. Eriksson, V. Stiernström

SuperAdjoint: Super-Resolution Neural Networks in Adjoint-based Output Error Estimation
T. Hunter*, A. Sitaram, S. Hulshoff

DynAMO: Dynamic Anticipatory Mesh Optimization for Hyperbolic PDEs using Reinforcement Learning
K. Mittal*, T. Dzanic, J. Yang, S. Petrides, D. Kim, B. Keith, A. Gillette, R. Anderson, D. Faissol

Adaptive Finite Elements With large aspect ratio for Aluminium Electrolysis
P. Passelli*, M. Picasso

Massively Parallel Simulation and Adaptive Mesh Refinement for 3D Elastostatics Contact Mechanics Problems
A. Epalle*, I. Ramière, G. Latu, F. Lebon

A Mesh Adaptation algorithm for highly deforming domains in the Particle Finite Element Method
T. Leyssens*, J. Remacle

Mon, 19/06/2023 16:00 - 18:00   Ledningsrummet-Valdemar Meeting Room
MS04-01MA. - MS04-Advanced Techniques for Data Assimilation, Inverse Analysis, and Data-based Enrichment of Simulation Models
Chaired by: Prof. Ludovic CHAMOIN (ENS Paris-Saclay)

Towards a More Efficient Evacuation of Crowds by Means of an Optimal Location of Exit Doors
L. Alvarez-Vazquez*, N. Garcia-Chan, A. Martinez, C. Rodriguez, M. Vazquez-Mendez

Algal Cultivation for Bioenergy Production: First Mathematical Modelling Results in Raceways
A. Martinez*, L. Alvarez-Vazquez, C. Rodriguez, M. Vazquez-Mendez

Model updating with a Modified Dual Kalman Filter acting on distributed strain measurements
S. Farahbakhsh*, L. Chamoin, M. Poncelet

On the Use of Neural Networks for Inverse Problems
L. Herrmann*, T. Bürchner, S. Kollmannsberger

Goal-oriented placement of depolluting panels in urban areas - application to a Paris district
J. Waeytens*, T. Hamada, R. Chakir, D. Lejri, F. Dugay

A modified Constitutive Relation Error (mCRE) framework to learn nonlinear constitutive models from strain measurements with thermodynamics-consistent Neural Networks
A. Benady*, L. Chamoin, E. Baranger

MS03-01MA. - MS03 - Applications of Goal-Oriented Error Estimation and Adaptivity
Chaired by: Prof. Serge Prudhomme (Polytechnique Montréal), Ms. Diane Guignard (University of Ottawa)

Space-Time Goal Oriented Error Estimation and Adaptivity for Discretization and Reduced Order Modeling Errors
J. Roth*, H. Fischer, J. Thiele, U. Köcher, A. Fau, L. Chamoin, T. Wick

Generation of Massive Databases for Deep Learning Inversion: A Goal-Oriented hp-Adaptive Strategy
J. Alvarez-Aramberri, V. Darrigrand, **F. Caro***, D. Pardo

Elliptic reconstruction and a posteriori error estimates for the parabolic partial differential equations with small random input data
N. Shravani, **M. Reddy***

A posteriori error estimates for the Crank-Nicolson method: application to parabolic partial differential equations with small random input data
S. Nakidi*, M. Reddy, M. Vynnycky

Error control and propagation in Adaptive Mesh Refinement applied to elliptic equations on quadtree/octree grids
L. Prouvost*, A. Belme, D. Fuster

Multiscale Finite Element approaches: error estimations and adaptivity for an enriched variant
F. Legoll*

Mon, 19/06/2023 18:00 - 19:00
RC-01MA - Reception

Tuesday, 20/06/2023

Tue, 20/06/2023 08:30 - 10:30   Runan Auditorium
MS01-02TM. - MS01-Recent Developments in Methods and Applications for Mesh Adaptation
Chaired by: Prof. Suzanne Shontz (University of Kansas)

A Coupled HDG-FV Method for Incompressible Flows Simulations
A. Felipe*, R. Sevilla, O. Hassan

Adaptive mesh refinement procedures for the virtual element method
D. van Huyssteen*, F. Rivarola, G. Etse, P. Steinmann

Moving mesh methods for implicit moving boundary problems
M. Hubbard*, A. Cangiani, T. Radley, H. Wells

Quadrilateral Mesh Untangling and Mesh Quality Improvement Via Multiobjective Mesh Optimization
M. Moradi, **S. Shontz***

Efficient unstructured mesh deformation using randomized linear algebra in Fluid Structure Interaction
Y. Mesri*

Generating Near-Optimal Meshes Using Green AI
C. Lock, O. Hassan, **R. Sevilla***, J. Jones

Tue, 20/06/2023 08:30 - 10:30   Ledningsrummet-Valdemar Meeting Room
MS04-02TM. - MS04- Advanced Techniques for Data Assimilation, Inverse Analysis, and Data-based Enrichment of Simulation Models
Chaired by: Prof. Ludovic CHAMOIN (ENS Paris-Saclay)

Learning Viscoelastic Responses with a Thermodynamic Recurrent Neural Network with Maxwell Encoding
N. Pistenon*, S. Cantournet, J. Bouvard, D. Pino-Munoz, P. Kerfriden

Modified Constitutive Relation Error for Multi-Physics Wind Turbine Calibration
A. Roussel*, L. Chamoin, J. Argaud, P. Bousseau

A Reduced Order Approximation for Identification of Non-linear Material Parameters using Optimal Control Method
M. Bhattacharyya*, P. Feissel

A "ROM+DDCM" framework for thermo-mechanical simulations
N. BLAL*

Real-time monitoring of additive manufacturing processes using a variational data assimilation method with model reduction and bias correction
L. Chamoin*, W. Haik, Y. Maday

Tue, 20/06/2023 08:30 - 10:30   Ascom-Catella Meeting room
MS03-02TM. - MS03 - Applications of Goal-Oriented Error Estimation and Adaptivity
Chaired by: Prof. Serge Prudhomme (Polytechnique Montréal), Ms. Diane Guignard (University of Ottawa)

Goal oriented error adaptivity for dynamic stress concentration With a Symmetric Boundary Element Galerkin Method
S. TOUHAMI*, D. AUBRY

Goal-Oriented Adaptive Finite Element Multilevel Monte Carlo with Convergence Rates
J. Beck, Y. Liu, **E. von Schwerin***, R. Tempone

Goal-Oriented Mesh Adaptation based on Optimization Approaches
S. Prudhomme*, D. Guignard, K. Kergrene, J. Vacher

Tue, 20/06/2023 10:30 - 11:00
CB-01TM - Coffee Break

Tue, 20/06/2023 11:00 - 11:45   Runan Auditorium
PL-02TM. - PL-II-Fabio Nobile
Adaptive multilevel Monte Carlo for risk averse optimization
Chaired by: Prof. Antonio Huerta (Universitat Politècnica de Catalunya)

Tue, 20/06/2023 11:45 - 12:45
LB-01TM - Lunch

Tue, 20/06/2023 12:45 - 14:45   Runan Auditorium
MS01-03TA + CT. - MS01 - Recent Developments in Methods and Applications for Mesh Adaptation + Discretization techniques and high-fidelity schemes
Chaired by: Prof. Suzanne Shontz (University of Kansas)

Adaptive and Parallel Local Mesh Generation Method and its Application
W. Zhang*, W. Guo, Y. Nie

Adaptive Flow Modelling for Coupled Thin Film and Bulk Fluid Flow
P. Suchde*

An Efficient hp-Adaptive Approach for Compressible Two-Phase Flows using the Level-Set Ghost Fluid Method
P. Mossier*, D. Appel, A. Beck, C. Munz

Verifying and applying LES-C turbulence models for turbulent incompressible flow and fluid-fluid interaction problems
M. Aggul, Y. Batugedara, A. Labovsky, E. Onal, **K. Schwiebert***

Surrogate Models of Geometrically Parameterized Flow Systems
A. Huerta*, Á. Borrás, R. Perelló-Ribas, M. Giacomini

Enforcing boundary conditions for finite elements in problems requiring continuity higher than C⁰
J. Moitinho de Almeida*

Tue, 20/06/2023 12:45 - 14:45   Ledningsrummet-Valdemar Meeting Room
MS02-01TA. - MS02 - Adaptive Methods for Surrogate and Reduced Order Modeling
Chaired by: Dr. Fredrik Ekre (TU Braunschweig, Institute of Applied Mechanics)

Accelerating model order reduction by multi-fidelity error estimation
L. Feng*, L. Lombardi, G. Antonini, P. Benner

Adaptive Strategies for Frequency Domain MOR - A Comparative Framework
Q. Aumann*, S. Chellappa, A. Nayak

Accelerated Simulation via Combination of Model Reduction, Surrogate Modeling and Reuse of Simulation Data
A. Strauß*, J. Kneifl, J. Fehr, M. Bischoff

A new Certified Hierarchical and Adaptive RB-ML-ROM Surrogate Model for Parametrized PDEs
B. Haasdonk, **H. Kleikamp***, M. Ohlberger, F. Schindler, T. Wenzel

A POD-Galerkin Model for Convection-Diffusion-Reaction Equations with Parametric Data based on Adaptive Snapshots
C. Mueller*, J. Lang

Tue, 20/06/2023 12:45 - 14:45   Ascom-Catella Meeting room
CT-01TA. - Multi-scale and multi-physics modeling + Optimization and inverse problems
Chaired by: Mr. Hakan Johansson

The use of adaptive FEM-SPH technique in high-velocity impact simulations
A. Cherniaev*

Relaxation of an over-constrained thermal problem for the determination of a geophysical temperature distribution
M. Fernandez*, S. Zlotnik, P. Díez

A Multiscale Method with Continuous Matter Addition in DED Additive Manufacturing Processes
M. Picos*, P. Barral, P. Quintela, J. Rodríguez

Mesh- and model adaptivity for elasto-plastic mean-field and full-field homogenization based on downwind and upwind approximations
A. Tchomgue Simeu*, R. Mahnken

Comparing FE2 procedures with seamless scale-bridging using a primal and dual formulation
K. Carlsson*, F. Larsson, K. Runesson

On the Discretization of the Continuous Adjoint to the Euler Equations in Aerodynamic Shape Optimization
M. Kontou*, X. Trompoukis, V. Asouti, K. Giannakoglou

Tue, 20/06/2023 14:45 - 15:00
CB-02TA - Coffee Break

Tue, 20/06/2023 15:00 - 17:00   Runan Auditorium
MS08-01TA. - MS08 - Adaptive Modelling, Optimisation and Learning Strategies for Image Analysis
Chaired by: Dr. Matteo Giacomini (CIMNE - Universitat Politècnica de Catalunya, Barcelona)

Human Brain Solute Transport Quantified by Glymphatic MRI-informed Biophysics during Sleep and Sleep Deprivation
V. Vinje, **B. Zapf***, G. Ringstad, P. Eide, M. Rognes, K. Mardal

Dimension Reduction of Dynamic Superresolution and Application to Cell Tracking in PET
M. Holler, **A. Schlüter***, B. Wirth

Sparse recovery problem in a hierarchical Bayesian framework
D. Calvetti, **M. Pragliola***, E. Somersalo

A Piggyback-Style Algorithm for Learning Improved Shearlets and TGV Discretizations
L. Bogensperger*, A. Chambolle, T. Pock

Segmentation of Inhomogeneous Noisy Images via a Bayesian Model Coupled with Anisotropic Mesh Adaptation
M. Giacomini*, S. Perotto

Tue, 20/06/2023 15:00 - 17:00   Ledningsrummet-Valdemar Meeting Room
MS02-02TA + CT. - MS02 - Adaptive Methods for Surrogate and Reduced Order Modeling + Reduced-order models
Chaired by: Prof. Ulrich Römer

Error estimation for surrogate models with noisy small-sized training sets
J. Wackers*, H. Pehlivan Solak, R. Pellegrini, A. Serani, M. Diez

Numerical model reduction of the electro-chemically coupled ion transport
V. Tu*, K. Runesson, F. Larsson, R. Jänicke

Clustering-based Parametric Surrogate Modeling of Vibroacoustic Problems Assisted by Neural Networks and Active Subspace Method
H. Sreekumar*, L. Outzen, U. Römer, S. Langer

Assessing the performance of Data-based and Physics-based Model Order Reduction techniques for Geometrically nonlinear problems
P. Babbepalli*, J. Remmers, O. Sluis

Gravity Load Effects on Inelastic Simulation of Buildings Subjected to Wind Loads
J. Judd*, J. Niedens

Fast Simulation of Wheel-Rail Contact Using Proper Generalized Decomposition
C. Ansin*, F. Larsson, R. Larsson, M. Ekh, B. Pålsson

Tue, 20/06/2023 15:00 - 17:00   Ascom-Catella Meeting room
MS06-01TA. - MS06 - Biomedical Simulations and Applications
Chaired by: Prof. Alberto García González (UPC), Dr. Juan José Ródenas García (Universitat Politècnica de València.)

Digital Volume Correlation techniques for patient-specific simulation of vertebrae with metastasis
L. Person, F. Hild, E. Nadal, **J. Ródenas***, O. Allix

Towards patient-specific modelling of Atherosclerotic Arterial Sections
S. Gahima*, P. Diez, M. Stefanati, J. Felix Rodriguez Matas, A. Garcia-Gonzalez

Dimensionality reduction and physics-based manifold learning for parametric models in biomechanics and tissue engineering
A. Muixí, **A. García-González***, S. Zlotnik, P. Díez

Tue, 20/06/2023 17:15 - 21:00
BD-01WA - Banquet Dinner

Wednesday, 21/06/2023

Wed, 21/06/2023 08:45 - 10:45　　　　　　　　　　　　　　　　　　　　　　　　　Runan Auditorium

MS07-01WM. - MS07 - Error Estimates and Adaptive Methods for IGA and Higher Order FEM
Chaired by: Prof. Trond Kvamsdal (Norwegian University of Science and Technology (NTNU))

A Posteriori Error Estimation for Second-Order Optimally Convergent G/XFEM
M. Bento*, S. Proença, C. Duarte

A posteriori error estimates of elliptic and parabolic equations for the weak Galerkin finite element methods
Y. Nie*, Y. Liu

High Continuity Basis's Impact on Continuous Global L2 (CGL2) Recovery
T. Kvamsdal*, A. Abdulhaque, M. Kumar, K. Johannessen, A. Kvarving, K. Okstad

Adaptive mixed isogeometric analysis of a highly convective benchmark problem for the Boussinesq equations
A. Abdulhaque*, A. Kvarving, T. Kvamsdal, M. Kumar

Wed, 21/06/2023 08:45 - 10:45　　　　　　　　　　　　　　　　Ledningsrummet-Valdemar Meeting Room

MS05-01WM + CT. - MS05 - SEC4TD Mini-Symposium on Tailings Dams Modelling and Data Assimilation for Monitoring + Reduced-order models + Machine Learning assisted computations
Chaired by: Prof. Francisco Hernández (WorldSensing)

The use of IoT technologies for advanced risk management in tailings dams
F. Hernández-Ramírez, **A. Bartoli***

SEC4TD Project To Improve the Safety of Tailings Storage Facilities
B. Bursa*, P. Stefaniak, I. Kakogiannos, I. Garcia-Mila Vidal, R. Protasiuk

Assessment of tailings dams using Model Order Reduction
S. Zlotnik*, C. Nasika, P. Díez, P. Gerard, T. Massart

Interpretable and Reusable Reduced Order Models for Digital Twins in Manufactory as a Service
V. Zambrano*, I. Viejo, G. Lopez, J. Alfonso, J. Rodriguez, G. Beltran, P. Talasila, S. Calvo

Machine Learning Assisted Mesh Adaptation for Geophysical Fluid Dynamics
S. Li, **E. Johnson***, J. Wallwork, S. Kramer, M. Piggott

Wed, 21/06/2023 08:45 - 10:45　　　　　　　　　　　　　　　　　　　Ascom-Catella Meeting room

CT-02WM. - Error estimation (due to discretization and/or modeling) + Uncertainty Quantification, and its connection with accuracy
Chaired by: Mr. Fabio Nobile (École Polytechnique Fédérale de Lausanne (EPFL))

Error Estimation for the Material Point and Particle in Cell Methods
M. Berzins*

Error Assessment for an Adaptive Finite Elements - Neural Networks Approach Applied to Parametric PDEs
A. Caboussat, **M. Girardin***, M. Picasso

On a direct procedure to construct a basis for the divergence free polynomial stress field space in 3D.
E. Maunder*

An Adaptive Trefftz Method to Analyze the Influence of the Midfield Propagation Conditions on Environmental Railway Noise
N. Ta*, L. Chamoin, A. Barbarulo, G. Puel, B. Faure

Runge Kutta (ELDIRK) methods for embedding of low order implicit time integration schemes for goal oriented global error estimation
R. Mahnken*

Design Allowables generation by High Fidelity Models for Interlaminar damage propagation based on Uncertainty Quantification
J. Ninyerola Gavaldà*, A. Sasikumar, A. Turon Travesa

Wed, 21/06/2023 10:45 - 11:15
CB-02WM - Coffee Break

Wed, 21/06/2023 11:15 - 12:00　　　　　　　　　　　　　　　　　　　　　　　　　Runan Auditorium

PL-03WM. - PL-III-Anders Logg
Modelling and Simulating Cities with Digital Twins
Chaired by: Dr. Fredrik Larsson

Wed, 21/06/2023 12:00 - 13:15　　　　　　　　　　　　　　　　　　　　　　　　　Runan Auditorium

C-01WM - Closure + Farewell Lunch