
Resume

Ido Akkerman

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Personal

Born: February 2, 1980

City of Birth: Lelystad

Nationality: Netherlands

Education

Ph.D. Aerospace Engineering, 2004 - 2009, Delft University of Technology

M.Sc. Aerospace Engineering (Cum Laude), 2001 - 2004, Delft University of Technology

B.Sc. Aerospace Engineering (Cum Laude), 1998 - 2001, Delft University of Technology

Appointments

Aug 2014 - Present:

Assistant Prof, Faculty Mechanical, Maritime and Materials Engineering, TU Delft

Tasks: teaching several classes, supervising MSc and PhD students, member of the exam committee Clinical technology, research in free-surface modelling and isogeometric analysis

Sept 2012 - July 2014:

Lecturer, Engineering and Computing Science, Durham University

Tasks: teaching 1st year mechanics and 2nd year mathematics, supervising students, member of the admissions committee, research in free-surface modelling and isogeometric analysis

Feb 2009 - Aug 2012:

Post-doctoral researcher, Department of Structural Engineering, UC San Diego

July 2011 - Aug 2011: Intern, Lawrence Livermore National Laboratory

June 2010 - May 2011: Intern, US Army Corps of Engineers, at UC San Diego

Tasks: developing free-surface and isogeometric analysis codes

Nov 2006 - Mar 2007:

Visiting Ph.D. student, ICES, The University of Texas, Austin

Task: developing and performing Large-eddy Simulations

July 2002 - Okt 2002 :

M.Sc. Internship , Industria de Turbo Propulsores (ITP) , Bilbao, Spain

Task: building a parametric model of engine nacelle for the analysis in Nastran

Supervision of PhD students

Matteo Bonci — Graduated 2019
Giovanni Bordogna — Graduated 2019
Nico van der Kolk — Graduated 2020
Gunnar Jacobi — Graduated 2020
Marco ten Eikelder — Graduated 2020 - Cum Laude
Jacob Lotz — Started 2020
Rafael Diez — Started 2020
Vasu Krishnan — Started 2021

Peer Reviewed Journal Articles

Full list attached
33 publications
H-index 18
[Google scholar](#)

Reviewer

Articles in several journals:

Computer Methods in Applied Mechanics and Engineering
Journal of Computational Physics
Computers and Fluids
Journal on Scientific Computing
Numerical methods in engineering
Applied Mathematics and Computation
Etcetera

Grants proposals for Research council Hong-Kong
Tenure track evaluation Pau university

International conferences

World Congress on Computational Mechanics (WCCM) 2006, 2008, 2010, 2016, 2018
US National Congress on Computational Mechanics (USNCCM) 2007, 2011
Finite Elements for Fluids (FEF) 2005, 2007, 2013, 2017
International Workshop on Water Waves and Floating Bodies (IWWWFB) 2018
Isogeometric Analysis and Applications (IGAA) 2018
Coupled Problems 2017
International Conference on Hydrodynamics (ICHHD) 2016
High-Order Finite Element and Isogeometric Method (HOFEIM) 2016 (invitation only)
European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS) 2012
International Conference on Isogeometric Analysis (IGA) 2011
Etcetera

Relevant training

UTQ obtained at TU Delft in 2019
Reddin management effectiveness course 2019

Language skills

Dutch, native
English, fluent (C2)

Computer skills

Linux, bash, git
C, C++, Fortran, Matlab
MPI, Petsc, VisIt, GMSH

Published articles

34] Machine Learning for the Prediction of the Local Skin Friction Factors and Nusselt Numbers in Turbulent Flows Past Rough Surfaces

RG Diez Sanhueza, I **Akkerman**, JWR Peeters

International Journal of Heat and Fluid Flow, submitted on invitation.

33] A space-time framework for periodic flows with applications to hydrofoils

J Lotz, MPF ten Eikelder, I **Akkerman**

Computer & Fluids, submitted. arXiv preprint arXiv:2211.10964 (2022).

32] A unified framework for Navier-Stokes Cahn-Hilliard models with non-matching densities,

MPF Ten Eikelder, KG van der Zee, I **Akkerman**, D Schillinger,

Mathematical Models and Methods in Applied Sciences, doi:10.1142/S0218202523500069

31] A monolithic finite element formulation for the hydroelastic analysis of very large floating structures

O Colomes Gene, F Verdugo, I **Akkerman**

International Journal for Numerical Methods in Engineering (2022).

30] A novel diffuse-interface model and a fully-discrete maximum-principle-preserving energy-stable method for two-phase flow with surface tension and non-matching densities

MPF ten Eikelder, I **Akkerman**

Computer Methods in Applied Mechanics and Engineering, 2021, 379, 113751

29] MFEM: A modular finite element methods library

R Anderson **et al**

Computers and Mathematics with Applications, 2021, 81, pp. 42–74

28] Nitsche's method as a variational multiscale formulation and a resulting boundary layer fine-scale model

SKF Stoter, MFP ten Eikelder, F de Prenter, I **Akkerman**, EH van Brummelen, CV Verhoosel, D Schillinger

Computer Methods in Applied Mechanics and Engineering, 2021, 382, 113878

27] Part 2: Simulation methodology and numerical uncertainty for RANS-CFD for the hydrodynamics of wind-assisted ships operating at leeway angles

NJ van der Kolk, I **Akkerman**, JA Keuning, RHM Huijsmans

Ocean Engineering, 2020, 201, 107024

26] A theoretical framework for discontinuity capturing: Joining variational multiscale and variation entropy

MFP ten Eikelder, Y. Bazilevs, I **Akkerman**

Computer Methods in Applied Mechanics and Engineering 359(2020) 112664

25] Isogeometric analysis of water waves using linear potential theory

I **Akkerman**, M Meijer, MFP ten Eikelder

Ocean Engineering 201(2020) 107114

24] Isogeometric modeling and experimental investigation of moving-domain bridge aerodynamics

TA Helgedagsrud, I Akkerman, Y Bazilevs, KM Mathisen, OA Øiseth

Journal of Engineering Mechanics 145-5 (2019), 04019026

23] Variation entropy: a continuous local generalization of the TVD property using entropy principles

MFP ten Eikelder, I **Akkerman**

Computer Methods in Applied Mechanics and Engineering 355 (2019), 261-283

- 22] Toward free-surface flow simulations with correct energy evolution: an Isogeometric level-set approach with monolithic time-integration
I Akkerman, MFP ten Eikelder
Computers & Fluids 181 (2019), 77-89
- 21] Correct energy evolution of stabilized formulations: The relation between VMS, SUPG and GLS via dynamic orthogonal small-scales and Isogeometric analysis. II: The incompressible Navier–Stokes equations
MFP ten Eikelder, **I Akkerman**
Computer Methods in Applied Mechanics and Engineering 340 (2018), 1135-1154
- 20] Correct energy evolution of stabilized formulations: The relation between VMS, SUPG and GLS via dynamic orthogonal small-scales and Isogeometric analysis. I: The convective–diffusive context
MFP ten Eikelder, **I Akkerman**
Computer Methods in Applied Mechanics and Engineering 331 (2018), 259-280
- 19] Monotone level-sets on arbitrary meshes without redistancing
I Akkerman
Computers & Fluids 146 (2017), 74-85
- 18] Aerodynamic simulation of vertical-axis wind turbines
A Korobenko, MC Hsu, **I Akkerman**, Y Bazilevs
Journal of Applied Mechanics 81-2 (2014), 021011
- 17] Isogeometric analysis of Lagrangian hydrodynamics: Axisymmetric formulation in the rz-cylindrical coordinates
Y Bazilevs, CC Long, **I Akkerman**, DJ Benson, MJ Shashkov
Journal of Computational Physics 262 (2014), 244-261
- 16] Finite element simulation of wind turbine aerodynamics: validation study using NREL Phase VI experiment
MC Hsu, **I Akkerman**, Y Bazilevs
Wind Energy 17-3 (2014), 461-481
- 15] Structural mechanics modeling and FSI simulation of wind turbines
A Korobenko, MC Hsu, **I Akkerman**, J Tippmann, Y Bazilevs
Mathematical Models and Methods in Applied Sciences 23-02 (2013), 249-272
- 14] Isogeometric analysis of Lagrangian hydrodynamics
Y Bazilevs, **I Akkerman**, DJ Benson, G Scovazzi, MJ Shashkov
Journal of Computational Physics 243 (2013), 224-243
- 13] Toward free-surface modeling of planing vessels: simulation of the Fridsma hull using ALE-VMS
I Akkerman, J Dunaway, J Kvandal, J Spinks, Y Bazilevs
Computational Mechanics, 50-6 (2012), 719-727
- 12] Wind turbine aerodynamics using ALE–VMS: validation and the role of weakly enforced BCs
MC Hsu, **I Akkerman**, Y Bazilevs
Computational Mechanics 50-4 (2012), 499-511
- 11] Free-surface flow and fluid-object interaction modeling with emphasis on ship hydrodynamics
I Akkerman, Y Bazilevs, DJ Benson, MW Farthing, CE Kees
Journal of Applied Mechanics 79-1 (2012), 010905

- 10] Large-eddy simulation of shallow water Langmuir turbulence using Isogeometric analysis and the residual-based variational multiscale method
A Tejada-Martinez, **I Akkerman**, Y Bazilevs
Journal of Applied Mechanics 79-1 (2012), 010909
- 9] High-performance computing of wind turbine aerodynamics using Isogeometric analysis
MC Hsu, **I Akkerman**, Y Bazilevs
Computers & Fluids 49-1 (2011), 93-100
- 8] A conservative level set method suitable for variable-order approximations and unstructured meshes
CE Kees, **I Akkerman**, MW Farthing, Y Bazilevs
Journal of Computational Physics 230-12 (2011), 4536-4558
- 7] Isogeometric analysis of free-surface flow
I Akkerman, Y Bazilevs, CE Kees, MW Farthing
Journal of Computational Physics 230-11 (2011), 4137-4152
- 6] 3D simulation of wind turbine rotors at full scale. Part I: Geometry modeling and aerodynamics
Y Bazilevs, MC Hsu, **I Akkerman**, S Wright, K Takizawa, B Henicke, T. Spielman T. E. Tezduyar
International Journal for numerical methods in fluids 65 (2011), 207-235
- 5] Goal-oriented error estimation and adaptivity for fluid–structure interaction using exact linearized adjoints
KG van der Zee, EH van Brummelen, **I Akkerman**, R de Borst
Computer Methods in Applied Mechanics and Engineering 200-37 (2011), 2738-2757
- 4] Large eddy simulation of turbulent Taylor–Couette flow using Isogeometric analysis and the residual-based variational multiscale method
Y Bazilevs, **I Akkerman**
Journal of Computational Physics 229-9 (2010), 3402-3414
- 3] A variational Germano approach for stabilized finite element methods
I Akkerman, KG van der Zee, SJ Hulshoff
Computer methods in applied mechanics and engineering 199-9 (2010), 502-513
- 2] The role of continuity in residual-based variational multiscale modeling of turbulence
I Akkerman, Y Bazilevs, VM Calo, TJR Hughes, SJ Hulshoff
Computational Mechanics 41-3 (2008), 371-378
- 1] Multiscale overlap coupling for hybrid computations
I Akkerman, SJ Hulshoff, R de Borst
Computer methods in applied mechanics and engineering 196-41 (2007), 4294-4303

References

Prof. Rene de Borst
The University of Sheffield, UK
r.deborst@sheffield.ac.uk

PhD Promotor.

Prof. Yuri Bazilevs
Brown University, RI, USA
yuri_bazilevs@brown.edu

Supervising professor of my post-doc at University of California, San Diego
Co-author on recent paper.

Prof. Thomas J.R. Hughes
University of Texas at Austin, TX, USA
hughes@ices.utexas.edu

Hosting professor during extended stay at UT Austin at the end of my PhD
PhD defense committee member.

Prof. Harald van Brummelen
Eindhoven University of Technology
e.h.v.brummelen@tue.nl

Former colleague at Aerospace Engineering. Co-author on recent paper.

Dr. Tzanio Kolev
Lawrence Livermore National Lab, CA, USA
tzanio@llnl.gov

MFEM head developer. Supervisor when I added NURBS-based IGA to the MFEM
codebase as part of my Post-doc. Co-author on recent paper.