

Julien VANHAREN

Ph.D. in Computational Fluid Dynamics

PERSONAL DATA

PLACE AND DATE OF BIRTH: Soissons, France | July 31, 1989
CITIZENSHIP: French
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PROFESSIONAL EXPERIENCE

JUN 2020 | Research engineer
[ONERA](#) in Châtillon, France
CEDRE developer
CEDRE is a multi-physics platform working on general unstructured meshes intended to both advance research and process industrial applications in the fields of energetics and propulsion. High-order and high-fidelity numerical methods. High Performance Computing optimization.

MAY 2017 | Postdoctoral fellow
MAY 2020 | [Inria Saclay - Île-de-France](#) in Palaiseau, France
Time-accurate anisotropic mesh adaptation for fluid-structure interaction (FSI) simulations
Implementation and validation of the Finite Element method for the unsteady linear elasticity equations. Coupling with a code solving the Euler equations based on the Finite Volume method. Development of error estimates for fluid-structure interaction applied to unsteady anisotropic mesh adaptation. Project RAPID funded by Direction Générale de l'Armement (DGA).

EDUCATION

MAY 2014 | Ph.D. in Computational Fluid Dynamics
APR 2017 | [AIRBUS & Université de Toulouse](#) in Toulouse, France
High-order numerical methods for unsteady flows around complex geometries
Collaboration between AIRBUS and CERFACS. Several numerical methods and codes are investigated for industrial applications. The coupling with a nonconforming grid interface of high-order schemes for structured and unstructured zones in elsA. The Spectral Difference Method in JAGUAR. The Lattice Boltzmann Methods in ProLB.

JUL 2016 | Argonne Training Program on Extreme-Scale Computing (ATPESC)
AUG 2016 | [Argonne National Laboratory \(ANL\)](#) in Lemont, IL, USA
Intensive, two-week training on the key skills, approaches, and tools to design, implement, and execute computational science and engineering applications on current high-end computing systems and the leadership-class computing systems of the future
Computer architectures and predicted evolution. Numerical algorithms and mathematical software. Approaches to building community codes for HPC systems. Data analysis, visualization, I/O, and methodologies and tools for big data applications. Performance measurement and debugging tools.

SEP 2012 | M.Sc. Fluid Dynamics
JUN 2013 | [ISAE-SUPAERO](#) in Toulouse, France

SEP 2009 | M.Sc. Aerospace and Aeronautical Engineering
JUN 2013 | [ISAE-SUPAERO](#) in Toulouse, France

TEACHING

JUN 2019 | Incompressible fluid mechanics [MF102]
[ENSTA Paris](#) in Palaiseau, France

MAY 2016 | Fundamentals to understand and analyze high fidelity compressible Large Eddy Simulation (LES)
[CERFACS](#) in Toulouse, France

LANGUAGES

ENGLISH	Full working proficiency
FRENCH	Native proficiency
GERMAN	Good working knowledge
POLISH	Basic communication skills

THESIS

- [11] Julien Vanharen. **High-Order Numerical Methods For Unsteady Flows Around Complex Geometries**. PhD thesis. Université de Toulouse, 2017. [\[PDF\]](#).

PEER-REVIEWED JOURNAL & CONFERENCE PAPERS

- [1] Frédéric Alauzet, Francesco Clerici, Adrien Loseille, Matthieu Maunoury, Lucien Rochery, Cosimo Tarsia-Morisco, Lucille-Marie Tenkes, and Julien Vanharen. **4th AIAA CFD High Lift Prediction Workshop results using metric-based anisotropic mesh adaptation**. *AIAA Fluid Dynamics Conference*. Chicago, IL, USA, 2022.
- [2] Frédéric Alauzet, Francesco Clerici, Adrien Loseille, Cosimo Tarsia-Morisco, and Julien Vanharen. **Some progress on CFD high lift prediction using metric-based anisotropic mesh adaptation**. *AIAA Scitech Forum*. San Diego, CA, USA, 2022. [\[10.2514/6.2022-0388\]](#).
- [3] Eric Quémerais, Bastien Andrieu, Bruno Maugars, Julien Coulet, Stéphanie Lala, and Julien Vanharen. **ParaDiGM: a library to handle Parallel Distributed General Meshes**. *22nd ONERA-DLR Aerospace Symposium, ODAS 2022*. Hamburg, Germany, 2022.
- [4] Julien Vanharen, Adrien Loseille, Frédéric Alauzet, and Micheal Andrew Park. **Nearfield anisotropic mesh adaptation for the third AIAA Sonic Boom Workshop**. *J. Aircr.* (2022). [\[10.2514/1.C036502\]](#).
- [5] Lucille-Marie Tenkes, Frédéric Alauzet, and Julien Vanharen. **Hybrid anisotropic mesh adaptation using metric-orthogonal approach**. *AIAA Scitech Forum*. Virtual Event, 2021. [\[10.2514/6.2021-1779\]](#).
- [7] Julien Vanharen, Adrien Loseille, and Frédéric Alauzet. **Non-manifold anisotropic mesh adaptation: application to fluid-structure interaction**. *Eng. Comput.* (2021). [\[10.1007/s00366-021-01435-2\]](#).
- [8] Julien Vanharen, Adrien Loseille, Frédéric Alauzet, and Michael Andrew Park. **Nearfield anisotropic mesh adaptivity for the third AIAA sonic boom workshop**. *AIAA Scitech Forum*. Virtual Event, 2021. [\[10.2514/6.2021-0347\]](#).
- [9] Julien Vanharen, Rémi Feuillet, and Frédéric Alauzet. **Mesh adaptation for fluid-structure interaction problems**. *AIAA Fluid Dynamics Conference*. Atlanta, GA, USA, 2018. [\[10.2514/6.2018-3244\]](#).
- [12] Julien Vanharen, Guillaume Puigt, Xavier Vasseur, Jean-François Boussuge, and Pierre Sagaut. **Revisiting the spectral analysis for high-order spectral discontinuous methods**. *J. Comput. Phys.* 337 (2017), 379–402. [\[10.1016/j.jcp.2017.02.043\]](#).
- [15] Julien Vanharen, Guillaume Puigt, and Marc Montagnac. **Theoretical and numerical analysis of nonconforming grid interface for unsteady flows**. *J. Comput. Phys.* 285 (2015), 111–132. [\[10.1016/j.jcp.2015.01.013\]](#).

CONFERENCES AND SEMINARS

- [6] Julien Vanharen. **Anisotropic mesh adaptation. Theory and applications**. CEA-Cesta seminar. Le Barp, France, 2021.
- [10] Julien Vanharen, Rémi Feuillet, and Frédéric Alauzet. **Mesh adaptation for fluid-structure interaction problems**. 6th European Conference on Computational Mechanics (ECCM 6). 7th European Conference on Computational Fluid Dynamics (ECFD 7). Glasgow, UK, 2018.
- [13] Julien Vanharen, Guillaume Puigt, Xavier Vasseur, Jean-François Boussuge, and Pierre Sagaut. **Comparing the resolution power of standard finite difference and spectral difference schemes**. TILDA - Symposium & Workshop on Industrial LES & DNS. Toulouse, France, 2016.
- [14] Julien Vanharen, Guillaume Puigt, Xavier Vasseur, Jean-François Boussuge, and Pierre Sagaut. **Revisiting the spectral analysis for high-order spectral discontinuous methods**. TILDA - Symposium & Workshop on Industrial LES & DNS. Toulouse, France, 2016.
- [16] Julien Vanharen, Guillaume Puigt, and Marc Montagnac. **Two-dimensional spectral analysis of nonconforming grid interface. Emphasis on unsteady flows**. 50th 3AF International Conference on Applied Aerodynamics. Toulouse, France, 2015.