Guglielmo Minelli

Curriculum Vitae *(October 31, 2024)*

Senior Analysis Engineer @ Volvo Cars
Affiliated Researcher @ VEAS, Chalmers
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Research and Work Experience

2024 – ***Junior Assistant Professor***, *University of Bologna*, Italy.
Department Industrial Engineering - CICLoPE Laboratory
Advisor: Prof. Alessandro Talamelli, *Department Industrial Engineering - CICLoPE Laboratory* (*Personal Web-page*)

2023 – 2024 ***Affiliated Researcher***, *Chalmers University of Technology*, Sweden.
Supervision of Master and Ph.D. students within Vehicle aerodynamics.
Advisor: Prof. Simone Sebben, *Vehicle Engineering and Autonomous Systems,* (*Personal Web-page*)

2020 – 2024 ***Senior Analysis Engineer***, *Volvo Cars*, Sweden.
Aerodynamics

2020 – 2022 ***Researcher***, *Volvo Cars*, Sweden.
Upscaling product development capability exploiting AI for electric vehicles, (*Web-page*)
Advisor: Dr. Johan Sterneus, *Team Manager Aerodynamics at Volvo Cars*

2021 ***Italian National Scientific Qualification***, *(Associate Professor Qualification)*.
09/A1 Aeronautical, Aerospace and Naval Engineering

2018 – 2020 ***Postdoctoral researcher***, *Chalmers University of Technology*, Sweden.
Computation of aeroacoustic sources and sound propagation for urban challenges, (*Web-page*).
Artificial intelligence and flow control: toward the automation of adaptive vehicle aerodynamics, (*Web-page*)
Advisor: Prof. Niklas Andersson, *Mechanics and Maritime Sciences*, (*Personal Web-page*)

2017 – 2018 ***CFD Engineer***, *AFRY*, Sweden.
Volvo Trucks, Aerodynamics

2012 – 2012 ***Research assistant***, *Chalmers University of Technology*, Sweden.
Bluff body fluid dynamics.
Advisor: Prof. Siniša Krajnović, *Mechanics and Maritime Sciences*, (*Personal Web-page*)

Education

2014 – 2017 ***Ph.D. in Thermo and Fluid Dynamics***, *Chalmers University of Technology*, Sweden.
Thesis Title: Active Flow Control for Reducing Drag on Trucks: from Concept to Full Scale Testing.(*Web-page*).
Advisor: Prof. Siniša Krajnović, *Mechanics and Maritime Sciences*, (*Personal Web-page*)

2010 – 2012 **Master Degree (M.Sc.) in Aerospace Engineering**, *University of Bologna*, Italy.
Thesis Title: A LES study of a modified Ahmed body geometry
Final mark: 110/110 cum laude
Advisor: Prof. Alessandro Talamelli, Department of Industrial Engineering, University of Bologna (*Personal Web-page*)

2007 – 2010 **Bachelor Degree (B.Sc.) in Aerospace Engineering**, *University of Bologna*, Italy.

Thesis Title: Design, construction, and validation of an actuation system for the separation tests of the microsatellite Almasat-EO.

Final mark: 103/110

Advisor: Prof. Paolo Tortora, Department of Industrial Engineering, University of Bologna (*Personal Web-page*)

Supervision and Teaching Experience

2022 – **Ph.D. student co-supervision**, *Volvo Cars*, Sweden.
Student: Avaneesh Upadhyaya
Supervisor: Prof. Simone Sebben, *VEAS, Chalmers University*

2023 – 2023 **M.Sc. student supervision**, *Volvo Cars*, Sweden.
Student: Pierfrancesco Oselin (thesis)
Examiner: Prof. Simone Sebben, *VEAS, Chalmers University*

2022 – 2022 **M.Sc. students supervision**, *Volvo Cars*, Sweden.
Students: Agam Sadan, Vicente Sartor Poloni (thesis)
Examiner: Prof. Simone Sebben, *VEAS, Chalmers University*

2018 – 2020 **Ph.D. students co-supervision**, *Chalmers University*, Sweden.
Students: Jiabin Wang, Tianyun Dong, Kan He
Supervisor: Prof. Siniša Krajnović, *Mechanics and Maritime Sciences, Chalmers University*

2019 – 2019 **M.Sc. student supervision**, *Chalmers University*, Sweden.
Student: Miguel Calixto De Sousa (thesis)
Examiner: Prof. Siniša Krajnović, *Mechanics and Maritime Sciences, Chalmers University*

2015 – 2018 **Teaching assistant**, *Chalmers University*, Sweden.
Course: Project in Applied Mechanics (5 students/year)
Given by: Prof. Valery Chernoray, *Mechanics and Maritime Sciences, Chalmers University*

2014 – 2017 **Teaching assistant**, *Chalmers University*, Sweden.
Course: Computational Fluid Dynamics (50 students/year)
Given by: Prof. Siniša Krajnović, *Mechanics and Maritime Sciences, Chalmers University*

Invited Lectures

Fall 2023 **Guest Lecturer**, *Passenger Vehicle Aerodynamics at Volvo Cars*, Lund University, Sweden.
Course: Vehicle Technology
Given by: Prof. Martin Tunér

2023 - 2024 **Guest Lecturer**, *Passenger Vehicle Aerodynamics at Volvo Cars*, KTH, Sweden.
Course: Vehicle Aerodynamics
Given by: Prof. Alessandro Talamelli

2023 - 2024 **Guest Lecturer**, *Passenger Vehicle Aerodynamics at Volvo Cars*, Chalmers University, Sweden.
Course: Road Vehicle Aerodynamics
Given by: Prof. Simone Sebben, *VEAS*

Pedagogical courses

2020 **Enhancing Learning through Writing**, *CLS940*, 5.0 hp, Chalmers University.

2020 **Supervising Research Students**, *CLS905*, 3.0 hp, Chalmers University.

2020 **Supervising Writing Processes**, *CLS910*, 2.0 hp, Chalmers University.

2020 **Teaching Project-Based Courses**, *CLS915*, 2.5 hp, Chalmers University.

2019 **Diversity and Inclusion for Learning in Higher Education**, *CIU965*, 2.5 hp, Chalmers University.

2019 **University Teaching and Learning**, *CIU950*, 3.0 hp, Chalmers University.

Publications (*Full list here*, *Scopus Score*)

Peer Reviewed Journal Articles

[2] Z. X. Qiao, G. Minelli, B. R. Noack, S. Krajnović, and V. Chernoray, "Trailing edge actuation for a bluff body at moderate yaw optimized with a genetic algorithm," *Physics of Fluids*, vol. 35, no. 12, p. 125 108, Dec. 2023, ISSN: 1070-6631. DOI: 10.1063/5.0174822. eprint: https://pubs.aip.org/aip/pof/article-pdf/doi/10.1063/5.0174822/18240560/125108_1_5.0174822.pdf.

[3] J. Wang, G. Minelli, G. Cafiero, *et al.*, "Validation of pans and effects of ground and wheel motion on the aerodynamic behaviours of a square-back van," *Journal of Fluid Mechanics*, vol. 958, 2023. DOI: 10.1017/jfm.2023.47.

[4] K. He, G. Minelli, X. Su, J. Wang, G. Gao, and S. Krajnović, "Floor motion's influence on wake asymmetry of a notchback bluff body," *Physics of Fluids*, vol. 34, no. 3, 2022. DOI: 10.1063/5.0084435.

[5] K. He, G. Minelli, X. Su, G. Gao, and S. Krajnović, "On state instability of the bi-stable flow past a notchback bluff body," *Journal of Fluid Mechanics*, vol. 931, 2022. DOI: 10.1017/jfm.2021.1025.

[6] T. Dong, G. Minelli, J. Wang, X. Liang, and S. Krajnović, "Numerical investigation of a high-speed train underbody flows: Studying flow structures through large-eddy simulation and assessment of steady and unsteady reynolds-averaged navier-stokes and improved delayed detached eddy simulation performance," *Physics of Fluids*, vol. 34, no. 1, 2022. DOI: 10.1063/5.0075617.

[7] K. He, G. Minelli, X. Su, G. Gao, and S. Krajnović, "Blockage influence on bi-stable flows of a notchback bluff body," *Physics of Fluids*, vol. 33, no. 12, 2021. DOI: 10.1063/5.0077251.

[8] K. He, G. Minelli, J. Wang, T. Dong, G. Gao, and S. Krajnović, "Numerical investigation of the wake bi-stability behind a notchback ahmed body," *Journal of Fluid Mechanics*, vol. 926, 2021. DOI: 10.1017/jfm.2021.748.

[9] K. He, G. Minelli, X. Su, G. Gao, and S. Krajnović, "Influence of the rounded rear edge on wake bi-stability of a notchback bluff body," *Physics of Fluids*, vol. 33, no. 11, 2021. DOI: 10.1063/5.0071925.

[10] K. He, G. Minelli, J. Wang, G. Gao, and S. Krajnović, "Assessment of les, iddes and rans approaches for prediction of wakes behind notchback road vehicles," *Journal of Wind Engineering and Industrial Aerodynamics*, vol. 217, 2021. DOI: 10.1016/j.jweia.2021.104737.

[11] J. Wang, G. Minelli, X. Miao, *et al.*, "The effect of bogie positions on the aerodynamic behavior of a high-speed train: An iddes study," *Flow, Turbulence and Combustion*, vol. 107, no. 2, pp. 257–282, 2021. DOI: 10.1007/s10494-020-00236-9.

[12] Z. Qiao, G. Minelli, B. Noack, S. Krajnović, and V. Chernoray, "Multi-frequency aerodynamic control of a yawed bluff body optimized with a genetic algorithm," *Journal of Wind Engineering and Industrial Aerodynamics*, vol. 212, 2021. DOI: 10.1016/j.jweia.2021.104600.

[13] G. Minelli, H.-D. Yao, N. Andersson, *et al.*, "Using horizontal sonic crystals to reduce the aeroacosutic signature of a simplified ice3 train model," *Applied Acoustics*, vol. 172, 2021. DOI: 10.1016/j.apacoust.2020.107597.

[14] J. Zhang, G. Minelli, B. Basara, R. Bensow, and S. Krajnović, "Yaw effect on bi-stable air-wakes of a generic ship using large eddy simulation," *Ocean Engineering*, vol. 219, 2021. DOI: 10.1016/j.oceaneng.2020.108164.

[15] J. Wang, G. Minelli, T. Dong, K. He, and S. Krajnović, "Impact of the bogies and cavities on the aerodynamic behaviour of a high-speed train. an iddes study," *Journal of Wind Engineering and Industrial Aerodynamics*, vol. 207, 2020. DOI: 10.1016/j.jweia.2020.104406.

[16] T. Dong, G. Minelli, J. Wang, X. Liang, and S. Krajnović, "The effect of reducing the underbody clearance on the aerodynamics of a high-speed train," *Journal of Wind Engineering and Industrial Aerodynamics*, vol. 204, 2020. DOI: 10.1016/j.jweia.2020.104249.

[17] J. Wang, G. Minelli, T. Dong, K. He, G. Gao, and S. Krajnović, "An iddes investigation of jacobs bogie effects on the slipstream and wake flow of a high-speed train," *Journal of Wind Engineering and Industrial Aerodynamics*, vol. 202, 2020. DOI: 10.1016/j.jweia.2020.104233.

[18] X. Miao, K. He, G. Minelli, *et al.*, "Aerodynamic performance of a high-speed train passing through three standard tunnel junctions under crosswinds," *Applied Sciences (Switzerland)*, vol. 10, no. 11, 2020. DOI: 10.3390/app10113664.

[19] J. Wang, G. Minelli, Y. Zhang, J. Zhang, S. Krajnović, and G. Gao, "An improved delayed detached eddy simulation study of the bogie cavity length effects on the aerodynamic performance of a high-speed train," *Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science*, vol. 234, no. 12, pp. 2386–2401, 2020. DOI: 10.1177/0954406220907631.

[20] T. Dong, G. Minelli, J. Wang, X. Liang, and S. Krajnović, "The effect of ground clearance on the aerodynamics of a generic high-speed train," *Journal of Fluids and Structures*, vol. 95, 2020. DOI: 10.1016/j.jfluidstructs.2020.102990.

[21] G. Minelli, H.-D. Yao, N. Andersson, P. Höstmad, J. Forssén, and S. Krajnović, "An aeroacoustic study of the flow surrounding the front of a simplified ice3 high-speed train model," *Applied Acoustics*, vol. 160, 2020. DOI: 10.1016/j.apacoust.2019.107125.

[22] G. Minelli, T. Dong, B. Noack, and S. Krajnović, "Upstream actuation for bluff-body wake control driven by a genetically inspired optimization," *Journal of Fluid Mechanics*, vol. 893, 2020. DOI: 10.1017/jfm.2020.220.

[23] G. Minelli, M. Tokarev, J. Zhang, *et al.*, "Active aerodynamic control of a separated flow using streamwise synthetic jets," *Flow, Turbulence and Combustion*, vol. 103, no. 4, pp. 1039–1055, 2019. DOI: 10.1007/s10494-019-00058-4.

[24] J. Wang, G. Minelli, T. Dong, G. Chen, and S. Krajnović, "The effect of bogie fairings on the slipstream and wake flow of a high-speed train. an iddes study," *Journal of Wind Engineering and Industrial Aerodynamics*, vol. 191, pp. 183–202, 2019. DOI: 10.1016/j.jweia.2019.06.010.

[25] A. Rao, J. Zhang, G. Minelli, B. Basara, and S. Krajnović, "Qualitative assessment of the bi-stable states in the wake of a finite-width double backward facing step," *Journal of Wind Engineering and Industrial Aerodynamics*, vol. 186, pp. 241–249, 2019. DOI: 10.1016/j.jweia.2019.01.007.

[26] A. Rao, J. Zhang, G. Minelli, B. Basara, and S. Krajnović, "An les investigation of the near-wake flow topology of a simplified heavy vehicle," *Flow, Turbulence and Combustion*, vol. 102, no. 2, pp. 389–415, 2019. DOI: 10.1007/s10494-018-9959-6.

[27] K. Obara, S. Krajnovic, G. Minelli, B. Basara, N. Okura, and M. Suzuki, "Large eddy simulation of a tornado flow around a train," *ERCOFTAC Series*, vol. 25, pp. 587–593, 2019. DOI: 10.1007/978-3-030-04915-7_77.

[28] A. Rao, G. Minelli, J. Zhang, B. Basara, and S. Krajnović, "Investigation of the near-wake flow topology of a simplified heavy vehicle using pans simulations," *Journal of Wind Engineering and Industrial Aerodynamics*, vol. 183, pp. 243–272, 2018. DOI: 10.1016/j.jweia.2018.09.019.

[29] G. Minelli, S. Krajnovic, and B. Basara, "A flow control study of a simplified, oscillating truck cabin using pans," *Journal of Fluids Engineering, Transactions of the ASME*, vol. 140, no. 12, 2018. DOI: 10.1115/1.4040225.

[30] J. Zhang, G. Minelli, A. Rao, B. Basara, R. Bensow, and S. Krajnović, "Comparison of pans and les of the flow past a generic ship," *Ocean Engineering*, vol. 165, pp. 221–236, 2018. DOI: 10.1016/j.oceaneng.2018.07.023.

[31] A. Rao, G. Minelli, B. Basara, and S. Krajnović, "On the two flow states in the wake of a hatchback ahmed body," *Journal of Wind Engineering and Industrial Aerodynamics*, vol. 173, pp. 262–278, 2018. DOI: 10.1016/j.jweia.2017.10.021.

[36] G. Minelli, E. Hartono, V. Chernoray, L. Hjelm, B. Basara, and S. Krajnović, "Validation of pans and active flow control for a generic truck cabin," *Journal of Wind Engineering and Industrial Aerodynamics*, vol. 171, pp. 148–160, 2017. DOI: 10.1016/j.jweia.2017.10.001.

[37] G. Minelli, E. Hartono, V. Chernoray, L. Hjelm, and S. Krajnović, "Aerodynamic flow control for a generic truck cabin using synthetic jets," *Journal of Wind Engineering and Industrial Aerodynamics*, vol. 168, pp. 81–90, 2017. DOI: 10.1016/j.jweia.2017.05.006.

[41] G. Minelli, S. Krajnović, B. Basara, and B. Noack, "Numerical investigation of active flow control around a generic truck a-pillar," *Flow, Turbulence and Combustion*, vol. 97, no. 4, pp. 1235–1254, 2016. DOI: 10.1007/s10494-016-9760-3.

[42] S. Krajnovic, G. Minelli, and B. Basara, "Partially-averaged navier-stokes simulations of flows around generic vehicle at yaw," *SAE Technical Papers*, vol. 2016-April, no. April, 2016. DOI: 10.4271/2016-01-1586.

[44] S. Krajnović, G. Minelli, and B. Basara, "Partially-averaged navier-stokes simulations of two bluff body flows," *Applied Mathematics and Computation*, vol. 272, pp. 692–706, 2016. DOI: 10.1016/j.amc.2015.03.136.

[47] S. Krajnović and G. Minelli, "Status of pans for bluff body aerodynamics of engineering relevance," *Notes on Numerical Fluid Mechanics and Multidisciplinary Design*, vol. 130, pp. 399–410, 2015. DOI: 10.1007/978-3-319-15141-0_32.

Conference Contributions

[1] A. Upadhyaya, S. Sebben, E. Willeson, and G. Minelli, "Effect of cooling airflow intake positioning on the aerodynamics of a simplified battery electric road vehicle," 2024. DOI: 10.4271/2024-01-2521.

[32] G. Minelli, T. Liu, J. Zhang, V. Chernoray, B. Basara, and S. Krajnović, "Flow control for a simplified truck using an array of streamwise synthetic jets," vol. 2018-July, 2018, pp. 665–676. DOI: 10.1615/THMT-18.690.

[33] A. Rao, J. Zhang, G. Minelli, B. Basara, and S. Krajnović, "Influence of the numerical schemes on the flow states of a simplified heavy vehicle," vol. 2018-July, 2018, pp. 731–734. DOI: 10.1615/THMT-18.760.

[34] G. Minelli, E. Adi Hartono, V. Chernoray, L. Hjelm, B. Basara, and S. Krajnović, "Development of active flow control for trucks," vol. 2018-March, 2018, pp. 1835–1843. DOI: 10.1615/TFEC2018.tff.021216.

[35] S. Krajnovic, A. Rao, G. Minelli, J. Zhang, and B. Basara, "Partially-averaged navier- stokes simulations in engineering flows," vol. 2018-March, 2018, pp. 543–546. DOI: 10.1615/TFEC2018.cmd.021221.

[38] K. Obara, S. Krajnovic, G. Minelli, N. Okura, and M. Suzuki, "Numerical simulation of flow around a train passing through a tornado," 2017. DOI: 10.11159/ffhmt17.158.

[39] G. Minelli, S. Krajnović, and B. Basara, "Pans study of the flow around an oscillating, simplified truck cabin with flow control," vol. 1B-2017, 2017. DOI: 10.1115/FEDSM2017-69341.

[40] G. Minelli, S. Krajnović, and B. Basara, "Les and pans of turbulent flow through a staggered tube bundle," vol. 1B-2017, 2017. DOI: 10.1115/FEDSM2017-69352.

[43] G. Minelli and S. Krajnović, "Numerical investigation of the actuated flow on a bluff body," vol. 185, 2016, pp. 295–302. DOI: 10.1007/978-3-319-30602-5_37.

[45] S. Krajnović and G. Minelli, "Partially-averaged navier-stokes simulation of the flow around simplified vehicle," vol. 1648, 2015. DOI: 10.1063/1.4912336.

[46] G. Minelli, S. Krajnović, and B. Basara, "Actuation of the flow field around a frontstep with a rounded leading edge," vol. 0, 2015, pp. 723–726.

CRediT taxonomy (web-page)

A-Conceptualization
B-Data Curation
C-Formal Analysis
D-Funding Acquisition
E-Investigation
F-Methodology
G-Project Administration
H-Resources
I-Software
J-Supervision
K-Validation
L-Visualization
M-Writing Original Draft
N-Writing Review and Editing

CRediT Taxonomy														
Papers	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**
[1]	X					X	X		X	X				X
[2]	X					X	X		X	X				X
[3]	X					X				X				X
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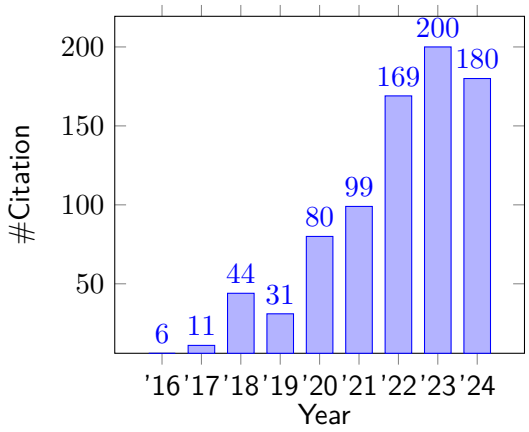
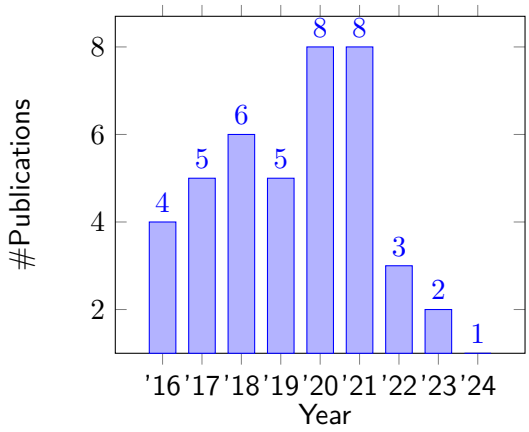
[40]	X	X	X		X	X			X		X	X	X	X
[41]		X	X		X	X			X		X	X	X	X
[42]	X	X	X		X	X			X		X	X	X	X
[43]		X	X		X	X			X		X	X	X	X
[44]		X	X		X	X			X		X	X	X	X
[45]	X	X	X		X	X			X		X	X	X	X
[46]		X	X		X	X			X		X	X	X	X

Bibliometric Information and Five Selected Publications (*Full Scopus Statistics*)

Bibliometric Statistics





Total Citations = 819
h-index = 19
% in top 25% journal = 83.8%
% International Collaboration = 87.2%

Five Selected Publications

- [22] *Upstream actuation for bluff-body wake control driven by a genetically inspired optimization*, JFM.
  Side activity during my postdoc. It showcases independence in research and proactive initiative.
- [13] *Using horizontal sonic crystals to reduce the aeroacosutic signature of a simplified ICE3 train model*, AA.
  Latest postdoc article, conducted independently on a new research topic to me. It reflects creativity and independent research capabilities.
- [5] *On state instability of the bi-stable flow past a notchback bluff body*, JFM.
  Side project during my postdoc. Topic taken from my Master Thesis work and further elaborated into a journal publication. Kan He (Ph.D. student at that time) carried out the analysis, I supervised the project and conceptualised the idea.
- [3] *Validation of PANS and effects of ground and wheel motion on the aerodynamic behaviours of a square-back van*, JFM.
  Independently initiated a collaboration with the University of Torino during my postdoc, showcasing initiative and proactiveness in research. Jiabin Wang (Ph.D. student at that time) carried out the analysis, I initiated the collaboration, conceptualised the idea and supervised the project.
- [37] *Aerodynamic flow control for a generic truck cabin using synthetic jets*, JWEIA.
  Latest Ph.D. article, it consolidates the skills I've been acquiring, emphasizing my analytical abilities in both CFD and experimental data. It also provides a comprehensive summary of the breadth of my Ph.D. research.

References

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