



Europass Curriculum Vitae

Personal information

First name / Surname **Alexandru DUMITRACHE**

Telephone

E-mail

Nationality Romanian

Date of birth

Work place **Retired since 2020**

Employed under contract GAR, no. 71/23.11.2023, as a member of the research team, position: scientific researcher CS II, during the project period (2024-2025), to the

Institute of Mathematical Statistics and Applied Mathematics "Gh. Mihoc – C. Iacob", Romanian Academy, 13 Septembrie 13, sect. 5, 050711, Bucharest, Romania

Work experience

Dates 2008 – 2020

Occupation or position held **Scientific researcher II**

Main activities and responsibilities Applied Mathematics - Analytical and numerical methods in fluid mechanics; Responsible for research projects

Name and address of employer Institute of Mathematical Statistics and Applied Mathematics "Gh. Mihoc – C. Iacob", Romanian Academy, 13 Septembrie 13, sect. 5, 050711, Bucharest, Romania

Type of business or sector Theoretical and applied research work / Fluid Mechanics Department

Dates 2004: (28.03-28.06.2004),

Occupation or position held **Postdoc scientific researcher**

Main activities and responsibilities Aeronautical Research Project : Multidisciplinary Optimization Standardization Approach for Integration and Configurability

Name and address of employer École de Technologie Supérieure, Montreal, CANADA

Type of business or sector Theoretical and applied research work / GPA Department

Dates 2003: (05.01-30.03.2003)

Occupation or position held **Postdoc scientific researcher**

Main activities and responsibilities Flow Control methods on wind turbine rotor

Name and address of employer Queen's University of Belfast, Belfast, Northern Ireland, UK
(Postdoctoral Research Fellowship, Royal Society – UK)

Type of business or sector	Theoretical and applied research work / Aerodynamic and Turbulence Laboratory
Dates	2002: (01.10-30.11)
Occupation or position held	Visiting researcher
Main activities and responsibilities	Benützung der Lösungen der Navier-Stokes Partial-Differential Gleichungen in der Agewandten Mathematik und Aerodynamik (The use of N-S equations in mathematics and applied aerodynamics)
Name and address of employer	Tehcnical University of Aachen (RWTH), Germany (Postdoctoral Research Fellowship, DAAD – German Interacademic Exchange)
Type of business or sector	Theoretical and applied research work / Aerodynamic Laboratory
Dates	2002 -2007
Occupation or position held	Scientific researcher III
Main activities and responsibilities	Applied Mathematics - Analytical and numerical methods in fluid mechanics; research projects
Name and address of employer	Institute of Mathematical Statistics and Applied Mathematics “Gh. Mihoc – C. Iacob” , Romanian Academy, 13 Septembrie 13, sect. 5, 050711, Bucharest, Romania
Type of business or sector	Theoretical and applied research work / Fluid Mechanics Department
Dates	2000 : (03.06.-24.06)
Occupation or position held	Visiting researcher
Main activities and responsibilities	: CFD in Aerodynamics of Wing
Name and address of employer	International Nathyagali Summer College on Physics and Contemporary Needs, Burban, Pakistan (Research Fellowship – ICTP and International Atomic Energy Agency – IAEA, Geneva)
Type of business or sector	Theoretical and applied research workshop
Dates	1999 : (27.09-22.10)
Occupation or position held	Visiting researcher
Main activities and responsibilities	: Mathematical modeling in industrial problems
Name and address of employer	“Abdus Salam” International Center of Theoretical Physics (ICTP), Str. Costiera 11, I – 34151 Trieste, Italy. (Research Fellowship – ICTP and ECMI (European Consortium for Mathematics in Industry))
Type of business or sector	Theoretical and applied research work
Dates	1993 : (01.05-30.06)
Occupation or position held	Visiting researcher
Main activities and responsibilities	Geometric and aerodynamically design of centrifugal fan
Name and address of employer	Deutsche Zentrum fur Luft und Raumfahrt (DLR), Aerodynamic and Turbulence Laboratory Fasanenstr. 85, 10623 Berlin, Germania (Research Fellowship, DAAD – German Interacademic Exchange)
Type of business or sector	Theoretical and applied research work / Aerodynamic and Turbulence Laboratory
Dates	1991- 2001
Occupation or position held	Scientific researcher III
Main activities and responsibilities	Applied Mathematics – Analytical and numerical methods in fluid mechanics
Name and address of employer	“Caius – Iacob” Institute of Applied Mathematics – Romanian Academy, 13 Septembrie nr. 13, 050711, Bucharest, Romania
Type of business or sector	Theoretical and applied research work
Dates	1990-1991
Occupation or position held	Scientific researcher III
Main activities and responsibilities	Aerodynamic calculus and design of aircraft propeller and axial compressor blade; experimental programs design .

Name and address of employer	National Institute of Scientific and Technical Creation, Bd Iuliu Maniu 220, 061126 Bucharest, Romania
Type of business or sector	Applied and Experimental Aerodynamics / Experimental Aerodynamic Laboratory
Dates	1982 – 1990
Occupation or position held	Scientific researcher
Main activities and responsibilities	design of air intake geometry for a training jet aircraft, project IAR –99; horizontal and vertical axis wind-turbine rotors , fan blade; flexible nozzle for a supersonic wind-tunnel (actually operating).
Name and address of employer	National Institute of Scientific and Technical Creation, Bd Iuliu Maniu 220, 061126 Bucharest, Romania
Type of business or sector	Applied and Experimental Aerodynamics / Applied research works / Experimental Aerodynamic Laboratory

EDUCATION AND TRAINING

Dates	1977 – 1982
Occupation or position held	Design engineer
Main activities and responsibilities	Structures design and technologist engineer for training aircraft YAK-52 and military aircraft MIG-21. Design of inferior part of the fuselage and horizontal and vertical tail unit of the aircraft YAK-52 and different spares parts for MIG 21
Name and address of employer	Aircraft Factory Bacau (actually AEROSTAR S.A.), Bacau, Romania
Type of business or sector	Structural design / Design Department
Dates	1991 - 1998
Title of qualification awarded	PhD in Aerodynamics and Fluid Mechanics
Principal subjects/occupational skills covered	Fluid Dynamics, Aerodynamics, Computational Fluid Dynamics (CFD)
Name and type of organisation providing education and training	POLITEHNICA University of Bucharest
Level in national or international classification	Doctor of Philosophy (PhD) ISCED 6
Dates	1972- 1977
Title of qualification awarded	Engineer
Principal subjects/occupational skills covered	Aerospace engineering / Specialization: Aircraft Structure and Design
Name and type of organisation providing education and training	Polytechnic Institute of Bucharest (present name: POLITEHNICA University of Bucharest)
Level in national or international classification	Mechanical Engineer ISCED 5

Teaching Experience

Dates (from – to)	ACADEMIC YEAR 1974/1975
Name and address of employer	“Politehnica” University Bucharest, Aerospace Engineering Faculty, Splaiul Independentei 313, Bucharest 060042
Type of business or sector	Teaching / Aerospace Engineering

Occupation or position held Associate Professor

Main activities and responsibilities Numerical Methods, Fluid Mechanics, Flight Mechanics, Optimization Methods in Aviation Transport, Aeroservoelasticity

Personal skills and competences

Mother tongue Romanian

Other language(s)

Understanding				Speaking				Writing	
Listening		Reading		Spoken interaction		Spoken production			
	C1		C2		C1		C1		C1
	C1		C2		C1		C1		C1
	B1		B2		B2		B1		B1

Self-assessment (*) [Common European Framework of Reference for Languages](#)

European level (*)

Organisational skills and competences

Coordinator of 6 national research projects,
Organizer of 15 international scientific conferences sections.

- **ICNAAM 2010** (8th International Conference of Numerical Analysis and Applied Mathematics, Rhodes, Greece, 19-25 September 2010): **Symposium on Mathematical Modeling and Numerical Analysis of Aerodynamics, Aeroelasticity and Noise for Wind Turbines.**

- **ICNAAM 2011** (9th International Conference of Numerical Analysis and Applied Mathematics, Halkidiki, Greece, 19-25 September 2011): **State of the Art of Modeling and Numerical Analysis for Wind Turbines.**

- **ICNPAA 2014 - World Congress:** 10th International Conference on Mathematical Problems in Engineering, Aerospace and Sciences, held at the Narvik University, Norway, July 15 - July 18, 2014 - **Session 17: State of the Art of Mathematical Modeling, Numerical Analysis, Optimization and Control of Renewable Energy Systems.**
(<http://icnpaa.com/index.php/icnpaa/2014/schedConf/trackPolicies>, S17)

- **2ND INT.CONF. ON MATHEMATICS AND COMPUTERS IN SCIENCES AND INDUSTRY - MCSI 2015**, SLIEMA, MALTA, August 17-19, 2015.
Special Session 5: **"Mathematical Modeling, Optimization and Control of Wind and Photovoltaic Power Plants"**, Organizers: **Alexandru Dumitrache** and Florin Frunzulica

- **ICNAAM 2015-** The 13th INTERNATIONAL CONFERENCE OF NUMERICAL ANALYSIS AND APPLIED MATHEMATICS 2015, held at the Rodos Palace Hotel, Rhodes, Greece, 23-29 September 2015.
Symposium 81: "State of the Art of Mathematical Modeling, Numerical Analysis, Optimization and Control of Green Energy Systems and Clean Environment", **Organizers: Alexandru Dumitrache, Florin Frunzulica and Daniel Crunteanu**

Technical skills and competences

Fluid Dynamics, Modeling, Analysis and Optimisation of Aerospace Structures, Computational Fluid Dynamics, Aeroelasticity/Fluid-Structure Interaction, Implementation of Numerical Schemes using Programming Languages

Computer skills and competences

ANSYS (Multiphysics, CFX, Fluent, Graphics (AutoCAD, Corel Draw, Adobe Photoshop), Programming languages (Fortran, C++), Mathematical software (MathCAD, MatLab), Microsoft Office Package, etc.

Artistic skills and competences

Graphics/Fine art

Driving licence	Yes, B category
Additional information	2006: (09.10-27.10.) "Abdus Salam" International Center of Theoretical Physics (ICTP), Trieste, Italy. <i>School on Nonlinear Differential Equations</i> (Prof. A. Ambrosetti, C.E. Chidume, D.De Figueiredo) Grant awarded by ICTP, Trieste, Italy. -GAMM member Gesellschaft für Angewandte Mathematik und Mechanik / International Association of Applied Mathematics and Mechanics - 1993 - EUROMECH member - - European Mechanics Society - 1993 - ECMI member - European Consortium for Mathematics in Industry -1996 - EUCASS member - European Consortium for Aero-Space Sciences - 2007 - AIAA member - American Institute of Aeronautics and Astronautics -2008
Annexes	Annex 1: List of papers. Annex 2: List of research projects.

September 2025

Dr. Alexandru Dumitrache

Annex 1

Short List of Papers

DUMITRACHE ALEXANDRU - Dr./ since 1998 / C.S. II /since 2008

1^o PhD Thesis:

(T1) **A. Dumitrache**, *Contribution on flow calculus by viscous-inviscid interactive methods* / (*Contributii la studiul curgerilor prin metode de interactiune vâscos-nevâscos*) Bucharest, 1998, vi+202 pg.

2^o Books (C1, C2 etc.), chapters in books (CC1, CC2 etc).

C1.H. Dumitrescu, V. Cardos, F. Frunzulica, **A. Dumitrache**, *Unsteady aerodynamics, aeroelasticity and aeroacoustic for wind turbines (Aerodinamica nestationara, aeroelasticitate si aeroacustica pentru Turbine de Vânt)* Romanian Academy Publishing House, Bucharest, 2007, 534 pg.

C2 H. Dumitrescu, V. Cardos, **A. Dumitrache**, *Aerodynamics for wind turbines* / (*Aerodinamica turbinelor de vânt*), Romanian Academy Publishing House, Bucharest, 2001, 330 pg.

C3 H. Dumitrescu, A. Georgescu, **A. Dumitrache**, V. Ceanga, J.S. Popovici, Gh. Ghita, B. Nicolescu, *Calculus of propellers, / (Calculul elicei)*, Romanian Academy Publishing House, Bucharest, 1990, 675 pg.

CC1 **A. Dumitrache**, H. Dumitrescu, *On interactive methods for steady and unsteady flows*, in: Research Trends in Mechanics, Vol. 3, Romanian Academy Publishing House, Bucharest, 2009, pp. 94-127. (CC1)

CC2 M. Popescu, **Al. Dumitrache** – *Stability of the periodic solutions for quasi-linear controlled systems in critical case*, Modeling, Simulation and Control of Nonlinear Engineering Dynamical Systems, Springer Science 2009, ISBN 978-1-4020-8777-6, e-ISBN 978-1-4020-8778-3, pp. 327-336. (CC2)

CC3 **Dumitrache Alexandru**, Frunzulica Florin and Ionescu Tudor, *Mathematical Modelling and Numerical Investigations on the Coanda Effect*, chapters (5) in book: Nonlinearity, Bifurcation and Chaos - Theory and Applications, book edited by Jan Awrejcewicz and Peter Hagedorn, InTech, ISBN 978-953-51-0816-0, DOI: 10.5772/50403, Published: October 24, 2012, pp. 101-132 (32 pag.) (CC2)

CC4 **A. Dumitrache**, F. Frunzulica and H. Dumitrescu, *Analysis of Combustion and Turbulence Models in a Cylindrical Combustion Chamber*, in: Progress in Industrial Mathematics at ECMI, Ed. Hans-George Bock et. all., vol. 17, Springer-Verlag Berlin Heidelberg 2012, pp. 470-478 (ISBN 978-3-642-25099-6).

CC5 **D5. Dumitrescu H., Dumitrache A., Malael I., Bogateanu R.,** *The Standard and Counter-Rotating VAWT Performances with LES. In book: Ferrer E., Montlaur A. (eds) Recent Advances in CFD for Wind and Tidal Offshore Turbines. Springer Tracts in Mechanical Engineering. Springer, Cham, (2019), pp.117-126, https://doi.org/10.1007/978-3-030-11887-7_11*

3^o Scientific papers / studies - I.S.I. and Proceedings I.S.I. (S1, S2 etc.)

1. Daniela-Nicoleta Vasile; Florin Frunzulică; **Alexandru Dumitrache**, *Low speed airfoil optimization using differential evolution algorithm*, AIP Conf. Proc. 3315, 190009 (2025)
<https://doi.org/10.1063/5.0286440>
2. AR Buhaianu, L Dinca, **A Dumitrache**, GM Benec-Mincu, *Numerical simulations of some characteristics for electrohydrostatic actuators used in aviation*, AIP Conf. Proc. 3094, 500057 (2024)
<https://doi.org/10.1063/5.0211894>
3. **A Dumitrache**, S.A. Popescu, R Bogateanu, B Suatean, *Design and analysis of an autonomous wind-*

photovoltaic hybrid system, AIP Conf. Proc. 3094, 340008 (2024)

<https://doi.org/10.1063/5.0211893>

4. C Katona, CA Safta, **A Dumitrache**, *Adjoint building design optimization coupled with a VAWT for wind energy harvesting through a sea coastal wind stream*, AIP Conf. Proc. 3094, 340004 (2024) <https://doi.org/10.1063/5.0210468>
5. Mereuta, Vlad-Andrei, Crunteanu, D., Frunzulica, F. , and **Dumitrache, A.** (2022). *Improving the efficiency of a wind turbine using blades with winglets*. AIP Conference Proceedings. 2425. 240008. 10.1063/5.0081730.
6. L Dinca, R Bogateanu, JI Corcau, **A Dumitrache**, Suatean B., *Numerical Simulation for Redundant Electro-Hydrostatic Servo-Actuators under Certain Special Conditions*, **Energies** **2022**, **15**(16), 5906; <https://doi.org/10.3390/en15165906>
7. Mereuta, Vlad-Andrei & Crunteanu, D. & Frunzulica, F. & **Dumitrache, A..** (2022). *CFD analysis of low-power vertical axis wind turbines*. AIP Conference Proceedings. 2425. 240009. 10.1063/5.0081732.
8. Pricop, Mihai & **Dumitrache, AI** & Niculescu, Mihai & Pepelea, Dumitru. (2020). *Design of horizontal-axis wind turbine using blade element momentum method*. AIP Conference Proceedings. 2293. 320009. 10.1063/5.0026576.
9. Bogdan Adrian Nicolin, **Alexandru Dumitrache**, Florin Frunzulica, *Structural analysis of a two-stage Rotor VAWT*, **AIP Conf. Proc.** 2425, 240010 (2022) <https://doi.org/10.1063/5.0081923>
10. Niculescu, Mihai & Pricop, Mihai & Cojocaru, Marius Gabriel & Fadgyas, M. & Dumitrache, A.. (2018). *Corrections for wind tunnel results for 2D high lift configurations using RANS simulations*. AIP Conference Proceedings. 2046. 020066. 10.1063/1.5081586.
11. Fadgyas, M. & Pricop, Mihai & Niculescu, Mihai & Cojocaru, Marius Gabriel & **Dumitrache, A..** (2018). *Semi-empirical relations for pressure distributions in hypersonic regime*. AIP Conference Proceedings. 1978. 370007. 10.1063/1.5043975.
12. Fadgyas, M. & Pricop, Mihai & Niculescu, Mihai & Cojocaru, Marius Gabriel & **Dumitrache, A..** (2018). *Fast computational hypersonic heat flux estimation*. AIP Conference Proceedings. 1978. 370006. 10.1063/1.5043974.
13. Niculescu, Mihai & Cojocaru, Marius Gabriel & Pricop, Mihai & Pepelea, Dumitru & **Dumitrache, A.** & Crunteanu, Daniel. (2017). *CFD analysis of a Darrieus wind turbine*. AIP Conference Proceedings. 1863. 420003. 10.1063/1.4992591.
14. ML Niculescu, MG Cojocaru, MV Pricop, D Pepelea, **A Dumitrache**, *CFD analysis of a Darrieus wind turbine*, AIP Conference Proceedings, Vol. 1863 (1), 420003, (2017) doi: 10.1063/1.4992591.
15. F Frunzulica, AC Macovei, **A Dumitrache**, D Crunteanu, *Directional control of a jet using synthetic jets*, AIP Conference Proceedings 1863 (1), 420008, (2017), doi.org/10.1063/1.4992596.
16. **A Dumitrache**, F Frunzulica, S Grigorescu, *Aerodynamic investigations of a disc-wing*, AIP Conference Proceedings 1798 (1), 020050, (2017), Accession Number: WOS:000399203000050; ISBN:978-0-7354-1464-8; ISSN: 0094-243X.
17. F Frunzulica, **A Dumitrache**, M Stoia-Desjka, *A method of harvesting energy from wind using a flapping wing*, AIP Conference Proceedings 1798 (1), 020057, (2017) Accession Number: WOS:000399203000057; ISBN:978-0-7354-1464-8; ISSN: 0094-243X.
18. Frunzulica, F; Oncescu, C; **Dumitrache, A**; Vintea, A: *Study of the Modelling of an Electromagnetic Launcher of Fire Extinguishing Loads*, AIP Conference Proceedings, Volume: 1738, Article Number: 410009, Published: 2016. **WOS:000380803300432**, ISBN:978-0-7354-1392-4, ISSN: 0094-243X (ISI Proceedings)
19. Frunzulica, F; Cismilianu, A; Boros, A; **Dumitrache, A**; Suatean, B: *A new Vertical Axis Wind Turbine Design for Urban Areas*, AIP Conference Proceedings, Volume: 1738, Article Number: 410008, Published: 2016. **WOS:000380803300431**, ISBN:978-0-7354-1392-4, ISSN: 0094-243X (ISI Proceedings).
20. **A. Dumitrache**, ·F. Frunzulica, D.E. Crunteanu, *Influence of unsteady flow on the aerodynamics and aeroacoustics of vertical axis wind turbines*, AIP Conference Proceedings 03/2015; 1648. DOI:10.1063/1.4912705.

21. F. Frunzulica, **A. Dumitrache**, B. Suatean, *Numerical investigations on dynamic stall control with passive elements*, AIP Conference Proceedings 03/2015; 1648. DOI:10.1063/1.4912700.
22. Bogos, Stefan; **Dumitrache, Alexandru**; Frunzulica, Florin, *Turbulence Models in CFD Simulation of Low-Reynolds Number Airfoils Flow*, AIP Conference Proceedings; 2015, Vol. 1648 Issue 1, p1-4.
23. Frunzulica, Florin; **Dumitrache, Alexandru**; Suatean, Bogdan, *Numerical Investigations of Passive Flow Control Elements for Vertical Axis Wind Turbine*, AIP Conference Proceedings; Dec. 2014, Vol. 1637 Issue 1, p331
24. **Alexandru Dumitrache**, Horia Dumitrescu, Florin Frunzulică, *Reynolds number and pitch blade effects on aerodynamic performances of small VAWTs in starting phase*, AIP Conf. Proc. 1558, 2013, pp. 1261-1264; doi: 10.1063/1.4825740
25. Florin Frunzulică, Horia Dumitrescu, **Alexandru Dumitrache** and Bogdan Suatean, *Control of dynamic stall phenomenon for vertical axis wind turbine*, AIP Conf. Proc.1558, 2013, pp. 1257-1260; <http://dx.doi.org/10.1063/1.4825739>.
26. S. Ilin, H. Dumitrescu, V. Cardos, and **A. Dumitrache**, *A free wake method for performance prediction of VAWT*, AIP Conf. Proc. 1479, 2012, pp. 1635-1638; doi:<http://dx.doi.org/10.1063/1.4756480>
27. **A. Dumitrache** and H. Dumitrescu, *An aeroelastic model for horizontal axis wind turbines*, AIP Conf. Proc. 1479, 2012, pp. 1639-1642; doi:<http://dx.doi.org/10.1063/1.4756481>
28. **Alexandru Dumitrache**, Horia Dumitrescu, Octavian Preotu, Florin Frunzulica, *Active Circulation Control for Horizontal Axis Wind Turbine*, AIP Conf. Proc. -- September 14, 2011 -- Volume 1389, pp. 1524-1527 NUMERICAL ANALYSIS AND APPLIED MATHEMATICS ICNAAM 2011; doi:10.1063/1.3637915.
29. Ion Malael, Horia Dumitrescu, **Alexandru Dumitrache**, *Methods to improve the Performance of the turbomachines using flow control*, AIP Conf. Proc. -- September 14, 2011 -- Volume 1389, pp. 1515-1519 NUMERICAL ANALYSIS AND APPLIED MATHEMATICS ICNAAM 2011; doi:10.1063/1.3637913
30. R. Mahu, F. Popescu, F. Frunzulică, and **Al. Dumitrache**: 3D CFD Modeling and Simulation of NREL Phase VI Rotor, AIP Conf. Proc. -- September 14, 2011 -- Volume 1389, pp. 1520-1523 NUMERICAL ANALYSIS AND APPLIED MATHEMATICS ICNAAM 2011; doi:10.1063/1.3637914.
31. M. Popescu, **Al. Dumitrache**, *Stabilization of feedback control and stabilizability optimal solution for nonlinear quadratic problems*, Communications in Nonlinear Science and Numerical Simulation, Volume 16, Issue 5, May 2011, Pages 2319-2327. (ISSN: 1007-5704, Impact Factor: 2.697).
32. **Dumitrache, A** ; Dumitrescu, H ; Frunzulica, F: *A Two-Layer Algebraic Turbulence Model for Compressible Flow in Turbomachinery Cascade*. Edited by: Fitt, AD; Norbury, J; Ockendon, H; Wilson, RE PROGRESS IN INDUSTRIAL MATHEMATICS AT ECMI 2008 Book Series: Mathematics in Industry, Volume: 15, Pages: 803-809, SPRINGER-VERLAG BERLIN 2010, DOI: 10.1007/978-3-642-12110-4_129, Document Type: Proceedings Paper Accession Number: WOS:000290182200129 ISBN:978-3-642-12109-8
33. Frunzulica, F ; Dumitrescu, H ; **Dumitrache, A** ; Cardos, V: *An Advanced Aeroelastic Model for Horizontal Axis Wind Turbines*. Edited by:Fitt, AD; Norbury, J; Ockendon, H; Wilson, RE PROGRESS IN INDUSTRIAL MATHEMATICS AT ECMI 2008 Book Series: Mathematics in Industry, Volume: 15, Pages: 851-856, SPRINGER-VERLAG BERLIN 2010, DOI: 10.1007/978-3-642-12110-4_136, Document Type: Proceedings Paper Accession Number: WOS:000290182200136 ISBN:978-3-642-12109-8
34. Horia DUMITRESCU, Vladimir CARDOȘ, **Alexandru DUMITRACHE**, Florin FRUNZULICĂ, *Low-Frequency Noise Prediction Of Vertical Axis Wind Turbines*, Proceedings of the Romanian Academy series A of the Romanian Academy volume 11, number 1/2010, pp. 47–54 (print/electronic ISSN 1454-9069).
35. H. Dumitrescu, **Al. Dumitrache**, V. Cardos, *On the furling mechanism for power regulation*, Proceedings of the Romanian Academy, Series A, Vol. 9, Nr 1/2008, (ISI)
36. Dumitrescu H, Cardos V, **Dumitrache A**, *Modelling of inboard stall delay due to rotation*, Science of Making Torque from Wind Book Series: Journal of Physics Conference Series, Vol. 75, Pages: 12022-12032, 2007.
37. M. Popescu, **A. Dumitrache**, *On the optimal control of affine nonlinear systems*, Mathematical Problems in Engineering, 2005(4), pp. 465-475 (ISI – Fact. Imp. 0,890).(ISSN: 1024-123X)
38. **Dumitrache, A**. *Analytisches Modell der Viskosen Strömung des Glasses während des Presvorganges*, ZAMM, vol. 81, supp/4, s833-834, 2001. (ISI – Fact. Imp. 1,296 /2017-2018).

39. Dumitrescu, H., Ion, S., **A. Dumitrache**, *Eddy viscosity entrainment correlation*, Journal of Aircraft, 30, 3(1993), (ISI- Fact Imp. 0,831 /2017-2018).

PATENTS

(B1) O. Preotu, **A. Dumitrache**, M.A. Lungu, *Carena aero-hidrodinamica cu rezistenta mica la inaintare si efect Coanda amplificat / Aero-hydrodynamic hull with low drag and amplified Coanda effect*, Oficiul de Stat pentru Inventii si Marci, Nr. Patent **RO126028-A0**, 2010.

(B2) O. Preotu, **A. Dumitrache**, F. Frunzulica, M.A. Lungu, G.I. Sirbu, M. Duta, *Instalatie pentru demonstrarea amplificarii directe a efectului Coanda*, Oficiul de Stat pentru Inventii si Marci, Nr. Patent **RO 132864-B1**, (depus 2018 - publicat 28/06/2024)

(B3) Preotu Octavian, **Dumitrache Alexandru**, Frunzulica Florin, Titlu Brevet: *Metoda si dispozitiv cu fante multiple independente pentru controlul curgerii pe extradusul aripii*, Autoritate:Oficiul de Stat pentru Inventii si Marci. Depus la 2011-09-13 cu nr. A 00895.

(B4) H. Dumitrescu, **A. Dumitrache**, F. Frunzulica, A. Craciunescu, C. Popescu, M. Popescu, Titlu Brevet: *TURBINĂ EOLIANĂ CU AX VERTICAL ȘI PALE DREPTE, CU AUTOPORNIRE ȘI ANULAREA CUPLULUI LA VITEZE MARI, / SELF-STARTING VERTICAL AXIS WIND TURBINE WITH STRAIGHT BLADE AND CANCELLATION OF TORQUE AT HIGH SPEEDS*, Autoritate:Oficiul de Stat pentru Inventii si Marci. Depus la 2016-11-12 cu nr. A 00904.

Other works and scientific contributions

More than 40 internal research reports during 1982-1991 at the National Institute of Scientific and Technical Creation - (INCREST) in the theoretical and experimental aerodynamics, of which we can mention those related to
aerodynamic design and numerical investigations of aerodynamic characteristics of aircraft propeller blades, of axial fan blades and the vertical axis wind turbines and Experimental Works in wind-tunnel.

September 2025

Dr. Alexandru Dumitrache

Annex 2: List of research projects.

Research and Development - Innovation Projects- based on Contract / Grant

International Research Contract

1	JOULE 2 – Contract nr. ERBJOU 2-CT92-0113 (in cadrul Programelor de Cercetare ale UE)	<i>Development of a new generation of design tools for HAWTs.</i>	CS III: Member of research team Project manager: Dr. H. Dumitrescu	1994-1995 Coord. NTUA Grecia
		National Research	Contracts	
Nr	Programm/Project	Title	Function	Period
1	Grant al ACADEMIEI ROMANE Contract GAR 2023, 71/23.11.2023	Modelarea de dimensiuni reduse pentru reglarea rezilienta a sistemelor complexe / (Reduced-order modeling for robust control of complex systems)	CS II: Member of research team	2023-2025
2	Program PN III – Experimental demonstrative project – PED 37/2017 (2017 - 2018).	<i>Demonstrator for direct Coanda effect amplification</i>	CS II: Member of research team CO: University of Craiova. Project manager: Assoc. Professor PhD. Eng. Octavian Preotu	2017-2018
3	Proiect PN-II-PT-PCCA-2013-4-0915 Ctr. 299/2014	<i>Lansator electromagnetic pentru stingerea incendiilor violente din foraj și lansării dronelor pentru investigații sau intervenții,</i>	CS II: Member of research team	2014-2016
4	Proiect no.PN-II-PT-PCCA-2011-3, contr.40/2012	Hybrid renewable energy system based on vertical axis wind turbine with integrated photovoltaic panels and magnetic suspension	CS II: Member of research team Project Director : Dr. H. Dumitrescu	2012-2016
5	Program PNCD II Domeniul 8, Spatiu si Securitate) Contract 72-181/2008 (OPATAN)	Turboprop engine nacelle aerodynamic optimization to increase flight safety and reduce pollution levels / <i>Optimizarea aerodinamica a nacelei motoarelor turbopropulsoare in vederea cresterii sigurantei zborului si a reducerii nivelului de poluare</i>	Responsible Project partner ISMMA CO: COMOTI SA	2008 - 2011
6	Program PNCD II Domeniul 8, Spatiu	Compressor compression level higher than 9, in one step / <i>(Compresor cu grad de</i>	Responsible Project partner ISMMA	2008 - 2011

	si Securitate) Contract 82-090/2008 (COMCIP)	<i>coprimare mai mare de 9, intr-o singura treapta)</i>	CO: COMOTI SA	
7	Program IDEI Contract 712/19.01.2009, CNCSIS/ – Cod 543	<i>Research on Coanda effect amplification</i>	CS II: Member of research team Project Director: Dr. O. Preotu, Univ. of Craiova	2009 - 2011
8	Program IDEI; Cod CNCSIS 880, Contract 152/2007	<i>Modeling aerodynamic separation delay due to rotation / (Modelarea întârzierii desprinderii aerodinamice datorită rotației).</i>	CS II: Member of research team (Project Director : Dr. H. Dumitrescu)	2007-2009
9	Programul PNCD II Domeniul 8, Spatiu si Securitate) Contract 81-055/2007 (PAMMDAV)	Multirotor aerial platform with vertical takeoff-landing. (Platforma aeriana multirotor cu decolare- aterizare verticala)	CS II: Member of research team (Project Director Dr. H. Dumitrescu)	2007-2009
10	Programul PNCD II (cod 2572, parteneriate, Domeniul 8, , Spatiu si Securitate) Contract 81-027/2007	Analysis and control of thermo-acoustic instabilities in air-jet engine combustion chamber. /Analiza si controlul instabilitatilor termo-acustice din camera de ardere a motoarelor aeroreactoare	Responsable project partner ISMMA (Director Project: Prof. dr. Sterian Danaila, COMOTI, Bucuresti)	2007-2010
11	Grant al ACADEMIEI ROMANE Contract GAR 27/17.08.2007	Stabilization of optimal solution for quadratics functionals in infinite time for linear and nonlinear controlled systems / (Solutii optimele stabilizatoare a functionalelor patratice cu timp infinit pentru sisteme de comanda liniare si neliniare.)	CS II: Member of research team (Responsabil Grant Dr. M. Popescu)	2007-2008
12	Grant CNCSIS 80GR/2006, 58GR/2007	Stability fundamental System of periodic solution, bifurcation for periodic solution Lagrangian orbits / (Stabilitate, sistem fundamental de solutii periodice, bifurcatia solutiilor pentru orbitele periodice Lagrangiene)	CS III: Member of research team (Director Project: Dr. M. Popescu)	2006-2008
13	Proiect de Excelenta CEEX-D11-44/2005 PNCDI-I	Optimal singular control and stability in dynamical systems / Control optimal singular si stabilitate in dinamica sistemelor.	Responsable partner ISMMA (Director Project: Dr. M. Popescu)	2005-2007

14	Programul SECURITATE si SPATIU, PNCDI-I COD S-035 Contract 3R/2006	Optimizing processes in pursuit-evasion problems with applications in aerospace dynamics / <i>(Optimizarea proceselor de urmarire – evadare in lupta aeriana si de interceptare orbitala pentru misiuni spatiale)</i>	Responsible partner ISMMA (Director Project: Dr. M. Popescu)	2006
15	Grant Academia Romana. – Proiect 315 Contract GR15/2005 Contract GR85/2006	Optimal control for nonlinear affine systems <i>/ (Control optimal pentru sisteme neliniare affine)</i>	CS III: Member of research team Project manager: Dr. M. Popescu	2005-2006
16	Programul AEROSPATIAL Contract de finanțare nr. 87/2003, MEC	Optimal control for nonlinear systems with applications at satellite control / <i>(Control optimal pentru sisteme neliniare, cu aplicatii la controlul satelitilor)</i>	Responsible partner ISMMA, Director Project: Dr. M. Popescu	2003-2005
17	Programul AEROSPATIAL Contract de finanțare nr. 89/2003, Subcontract 228/2003	<i>Developing of analytical models and numerical codes for analysis of flows with application in aerospace /</i> <i>(Elaborarea de modele analitice si coduri numerice pentru analiza unor curgeri cu aplicatie in domeniul aerospacial.)</i>	CS III: Member of research team Resp. Proiect: Dr. H. Dumitrescu CO: INCAS SA	2003-2005
18	Programul AEROSPATIAL Cod proiect 41030, Contract finantare nr. 149/12.X.2004.	<i>Unsteady aerodynamics, aeroelasticity and aeroacoustic of free rotors / (Aerodinamica nestationară, aeroacustica și aeroelasticitatea rotoarelor libere)</i>	CS III: Member of research team Director Project: Dr. H. Dumitrescu	2004-2005
19	Programul AEROSPATIAL, cod 21036, Ctr.54/2002,	Synthesis Methods for aerospace systems / <i>(Metodologii de sinteza a controlului antisaturant pentru sisteme aeroasistate prin determinarea indicilor de performanta cu orizont infinit.)</i>	CS III: Member of research team Project manager: Dr. M. Popescu CO: INCAS SA	2002-2004
20	Grant 33505/2002, MEC	<i>Optimal and partial control for optimal transfer trajectories /</i> <i>(Control optimal si partial pentru traiectorii optime de transfer)</i>	CS III: Member of research team Responsible Dr. M. Popescu	2002-2004
21	Programul AEROSPATIAL	Optimization Orbital Rendez-vous and Aeroasisted Trajectories	CS III: Member of research team	2001-2003

	Cod 11036 Contract 20/2001	<i>/ (Control optimal pentru probleme de urmarire – rendez vous spatial orbital si traiectorii optime aeroasistate)</i>	Director Project: Dr. M. Popescu	Partener: INCAS S.A.
22	Grant MEC	<i>Singular and partial singular control for orbital transfer trajectories / (Control singular si partial singular pentru traiectoriile de transfer orbital)</i>	CS III: Member of research team Director Project: Dr. M. Popescu	2001-2002
23	Grant ANSTI COD 300 Contract de Grant 6101GR/2000 (Tema B5)	<i>Developing a new generation of design methods for HAWT / (Dezvoltarea unei noi generatii de turbine de metode de proiectare pentru turbinele de vânt cu ax orizontal)</i>	CS III: Member of research team Project manager: Dr. H. Dumitrescu	2000-2002
24	Grant ANSTI COD 302 Contract de Grant 6101GR/2000 (Tema B4)	<i>Singular optimal control for controlled dynamical systems (Controlul optimal singular pentru sisteme dinamice comandate.)</i>	CS III: Member of research team Responsable Grant: dr. Mihai Popescu	2000-2002
25	Grant ACADEMIA ROMANA	<i>Study of aerodynamic airfoif with Oscillatory coupled motion (Studiul profilelor aerodinamice cu miscari oscilatorii cuplate)</i>	CS III: Member of research team Responsable Grant: dr. V. Cardos	2000
26	Grant ACADEMIA ROMANA	<i>Study of free wake by indicial method (Studiul dărei libere prin metoda indicial)</i>	CS III: Member of research team Project Manager: dr. H. Dumitrescu	1996
27	Grant MEC	<i>Study of dynamic stall using indicial method (Studiul desprinderii dinamice prin metoda indiciala)</i>	CS III: Member of research team Project Manager: dr. H. Dumitrescu	1996
28	Grant ACADEMIA ROMANA	<i>Vortex theory of propeller – unsteady problem (Teoria turbionara a elicei – problema nestationara)</i>	CS III: Member of research team Responsable GAR: dr. H. Dumitrescu	1995

September 2025

Dr. Alexandru Dumitrache