Alexandros Kontogiannis

Ph.D Candidate at Polytechnique Montréal
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Experience

Polytechnique Montréal - Ph.D Candidate — Montreal · 09/2017–Present

Multiphysic aerodynamic shape optimization for subsonic/transonic flows and in-flight atmospheric icing conditions. A derivative-free optimization algorithm is combined with an adjoint-based surrogate model to efficiently incorporate incomplete derivative information for generalised nonsmooth optimization. (Prof. in charge: E. Laurendeau)

ONERA - Research Assistant — Toulouse · 03/2017–08/2017

Worked with the icing group of the *Department of Multiphysics for Energetics* (DMPE) on

- Benchmarking ONERA's icing prediction code using glaze ice experiments from NASA's Icing Research Tunnel.
- Development of new integral boundary layer models and wall functions for the momentum and thermal properties of ice-roughened surfaces with application to ice accretion prediction on airfoils. (Prof. in charge: P. Villedieu)

NTUA/UPAT - Diploma Thesis — Athens/Patras · 01/2016–3/2017

Thesis subject: *Viscous-Inviscid Fluid-Structure Interaction Method for the Analysis of High-Lift Morphing Airfoils*

Part · I of thesis work conducted at Laboratory of Aerodynamics of National Technical University of Athens (NTUA)

- Development of a strongly coupled viscous-inviscid interaction code based on XFOIL boundary layer formulation for multielement airfoils (Fortran). (Prof. in charge: V. Riziotis)

Part · II of thesis work conducted at Structural Mechanics and Smart Materials Laboratory of University of Patras (UPAT)

- Coupling of the in-house aerodynamic code with finite element software for the analysis of morphing multielement airfoils with shape-memory alloy (SMA) wire actuators. (Prof. in charge: D. Saravanos)

Education

University of Patras — Patras · 2011–2017

Graduated 3rd with *highest honors* (GPA 8.67/10) from Mechanical Engineering and Aeronautics Department (BSc.+MSc.).

Major subjects: *Fluid Mechanics · Computational Fluid Dynamics · Finite Element Methods · Aerodynamics*
Thesis subject: *Viscous-Inviscid Fluid-Structure Interaction Method for the Analysis of High-Lift Morphing Airfoils*
(Thesis GPA 10/10) Professors in charge: D. Saravanos, V. Riziotis (NTUA)

Technical Skills

Coding		Cad/Cae		Visualization		Other
C/C++	Python	CatiaV5	OpenFOAM	Inkscape	Gnuplot	LaTeX, Git
Fortran	Bash/Shell	Gmsh	SU^2	Tikz	Tecplot	Linux and HPC

Awards and Grants

Technical Chamber of Greece (TEE) Award for Top Graduate Students · 12/2018

Award of Academic Excellence by the Limmat Foundation of Zurich · 12/2017

A. Mentzelopoulos Scholarship for Ph.D studies in U.S.A and Canada · 09/2017

3rd Place in ActInSpace CNES/ESA/AIRBUS Competition · 05/2016

2nd Place for Design in Design-Build-Fly Aeronautical Competition · 08/2015

Greek State Scholarship Foundation Award for High Student Performance · 09/2012

Certificates (MOOC)

EPFLx Certificate on Plasma Physics: Introduction · 12/2017

MITx Certificate on Flight Vehicle Aerodynamics · 06/2014

Selected Seminars

Design in Chaos: Adjoints of LES and Least Squares Shadowing (Q. Wang) ISAE · Toulouse · 06/2017

Introduction to Advanced Research Computing (ComputeCanada) McGill Univ. · Montreal · 09/2017

Teaching Experience

Lecture Series in Low-Speed Aerodynamics University of Patras · 2014

Seminar in 'Shape Optimization with Adjoints in Fluid Dynamics' McGill University · 2018

Journal Publications and Conference Papers

1. A. Kontogiannis and E. Laurendeau. Nonsmooth Aerodynamic Shape Optimization with an Adjoint-Based Surrogate and Multiphysical Constraints. *In preparation.*
2. A. Kontogiannis. Adjoint State of Pseudo-3D RANS with the Spalart-Allmaras Turbulence Model. *In preparation.*
3. A. Kontogiannis, M. Parenteau, and E. Laurendeau. Viscous-Inviscid Analysis of Transonic Swept Wings using 2.5D RANS and Parametric Shapes. In *AIAA Scitech 2019 Forum*. American Institute of Aeronautics and Astronautics, Jan 2019. doi:10.2514/6.2019-2116
4. T. Machairas, A. Kontogiannis, A. Karakalas, A. Solomou, V. Riziotis, and D. Saravanos. Robust fluid-structure interaction analysis of an adaptive airfoil using shape memory alloy actuators. *Smart Materials and Structures*, 27(10):105035, 2018. doi:10.1088/1361-665X/aad649
5. E. Radenac, A. Kontogiannis, C. Bayeux, and P. Villedieu. An extended rough-wall model for an integral boundary layer model intended for ice accretion calculations. In *2018 AIAA Atmospheric and Space Environments Conference*, Atlanta, Georgia, 2018. doi:10.2514/6.2018-2858
6. A. Kontogiannis, A. Prakash, E. Laurendeau, and F. Moens. Sensitivity of Glaze Ice Accretion and Iced Aerodynamics Prediction to Roughness. In *26th Annual Conference of the Computational Fluid Dynamics Society of Canada*, Winnipeg, Manitoba, 2018. ResearchGate link.
7. P. Trontin, A. Kontogiannis, G. Blanchard, and P. Villedieu. Description and assessment of the new ONERA 2D icing suite IGLOO2D. In *9th AIAA Atmospheric and Space Environments Conference*, Denver, Colorado, 2017. doi:10.2514/6.2017-3417

8. A. Karakalas, T. Machairas, A. Kontogiannis, A. Solomou, V. Riziotis, and D. Saravanos. A Robust Fluid-Structure Interaction Numerical Tool for the Analysis of Airfoil Morphing Structures with Shape Memory Alloy Actuators. In *VIII ECCOMAS Thematic Conference on Smart Structures and Materials (SMART)*, Madrid, Spain, 2017

Conferences Attended and Podium Presentations

1. 26th Annual Conference of the CFD Society of Canada, Winnipeg, Manitoba, June 2018 (*Podium Presentation*)
2. AIAA SciTech 2019 Forum, San Diego, California, January 2019 (*Podium Presentation*)

Affiliations

American Institute of Aeronautics and Aerospace (AIAA) · Student Membership

Society for Industrial and Applied Mathematics (SIAM) · Graduate Student Membership

Journal Article Reviews

Wind Energy, Wiley · 2019-Present

References

Riziotis Vasilis · National Technical University of Athens

Assistant Professor, School of Mechanical Engineering, Section of Fluids || e-mail: vasilis@fluid.mech.ntua.gr

Tsogtgerel Gantumur · McGill University

Associate Professor, Department of Mathematics and Statistics || e-mail: gantumur.tsogtgerel@mcgill.ca

Philippe Villedieu · ONERA & Institut de Mathématiques de Toulouse (INSA)

Scientific Deputy Director, Department of Mutiphysics for Energetics (DMPE), ONERA || e-mail: philippe.villedieu@onera.fr

Saravanos Dimitris · University of Patras

Professor, Department of Mechanical Engineering and Aeronautics, Structural Mechanics and Smart Materials Group || e-mail: saravanos@mech.upatras.gr