

Curriculum Vitae

Theodoros T. Machairas
Dipl. Mechanical & Aeronautical Engineer

Personal Details

Name/ Surname	Theodoros/Machairas
Place of birth	Athens
Nationality	Hellenic
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Education

May 2010- Present

PhD Candidate at Mechanical and Aeronautical Engineering Department of University of Patras at Applied Mechanics Laboratory, in Structural Analysis and Active Materials group. Research area: Design and analysis of morphing structures activated by Shape Memory Alloy actuators (Supervisor: D.A. Saravanos).

September 2004- March 2010

Undergraduate studies at Mechanical and Aeronautical Engineering Department of University of Patras (five years curriculum).
Specialization in Applied Mechanics, Technology of Materials and Biomechanics section.

Acquisition of Mechanical and Aeronautical Engineer Diploma (Grade: 7.68 / 10)

Semester Thesis: “Review and Evaluation of Thermomechanical Constitutive Models for Shape Memory Alloys” (Supervisor: D.A. Saravanos)

Diploma Thesis : “Simulation of Adaptive Flaps activated by SMA Wire Actuators” (Supervisor: D.A. Saravanos)

June 2004

Graduation from 5th high School of Byron, Athens, Greece (Grade 18.6/20)

Languages

Greek	Mother Tongue
English	Very good knowledge (Certificate of Proficiency, University of Michigan)
French	Basic knowledge (Delf 1 ^{er} degree)

IT Skills

General Purpose	Microsoft Windows, Origin, Microsoft Office suite (Word, Excel, Powerpoint), Matlab
Drawing software	CATIA, Autocad
FE Programs	ABAQUS, Nastran/Patran
Programming Languages	Fortran, Python

Professional & Teaching Experience

April 2009-Present	Research Assistant at Applied Mechanics Lab. in Structural Analysis and Active Materials Group. Mechanical and Aeronautical Engineering Department of University of Patras
February 2010- February 2014	Teaching assistant of the laboratory exercises of the courses “Finite Element Methods for Structural Analysis” and “Introduction to Finite Element Method” at Mechanical and Aeronautical Engineering Department of University of Patras
May 2012 – August 2012	Internship, Texas A&M University, Aerospace Engineering Department

Participation in Research Projects

**April 2009- March 2012 &
October 2012- March 2013 &
November 2013 – February 2014**

“OPENAIR FP7 -Transport: Optimisation for low Environmental Noise impact AIRcraft ”

April 2012 - September 2012

“SMYTE FP7-JTI : Advanced concepts for trailing edge morphing wings - Design and manufacturing of test rig and test samples - Test execution”

**April 2013 – October 2013 &
March 2014 – April 2014 & June
2014 – November 2014**

“MOSKIN FP7-JTI : Morphing Skin with a Tailored Non-conventional Laminate ”

**May 2014 & December 2014 -
present**

“INNWIND.EU- FP7 COLLABORATIVE: Innovative wind conversion systems (10-20MW) for offshore applications”

Publications

Journals

1. Karagiannis Dimitris, Stamatelos Dimitrios, Spathopoulos Theodoros, Solomou Alexandros, Machairas Theodoros, Chrysohoidis Nikos, Saravanos Dimitris, “Airfoil morphing based on SMA actuation technology”, Journal of Aircraft Engineering and Aerospace Technology, vol. 86, issue 4
2. Alexandros G. Solomou, Theodoros T. Machairas and Dimitris A. Saravanos, “A Coupled Thermomechanical Beam Finite Element for the Simulation of Shape Memory Alloy Actuators”, Journal of Intelligent Material Systems and Structures, May 2014, vol 25, issue 8
3. Alexandros G. Solomou, Theodoros T. Machairas, Dimitris A. Saravanos, Darren J. Hartl and Dimitris C. Lagoudas, “A coupled layered thermomechanical shape memory alloy beam element with enhanced higher order temperature field approximations”, Journal of Intelligent Material Systems and Structures

Conferences

1. Machairas, T.T., Solomou. A.G., Saravanos, D.A., On the development of a Morphing Chevron with SMA Wire Actuators. 22nd International Conference on Adaptive Structure Technologies (ICAST) , Corfu, Greece 10-12 October 2011

2. Alexandros G. Solomou, Theodoros T. Machairas, and Dimitris A. Saravanos, "A Coupled Thermomechanical Beam Finite Element for the Simulation of Shape Memory Alloy Actuators", Proceedings of ICAST 2012, Nanjing, China
3. Machairas, T. T., Hartl, D.J., Saravanos, D.A., Lagoudas, D.C., "Multilevel Optimization of a Morphing Structure Incorporating Shape Memory Alloy Wires", 54th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Boston, MA; United States; 8 April 2013 through 11 April 2013
4. Alexandros G. Solomou, Theodoros T. Machairas, and Dimitris A. Saravanos, "Thermomechanically Transient Response Prediction of Morphing Structures with Shape Memory Alloy Actuators", Proceedings of ICAST 2013, Aruba
5. Machairas, T. T., Solomou, A. G., Saravanos, D. A., "A Morphing Chevron Actuated By Shape Memory Alloy Wires For Noise Reduction", Greener Aviation: Clean Sky breakthroughs and worldwide status, Brussels, March 12-14, 2014.
6. Karakalas A., Machairas T., Solomou A., Riziotis V. and Saravanos D., "Design and Simulation of Morphing Airfoil Sections with SMA Actuators for Wind Turbine Rotors", 25nd International Conference on Adaptive Structures and Technologies, Hague, Netherlands, October 6-8, 2014.
7. Karakalas A., Machairas T., Solomou A., Riziotis V. and Saravanos D., "Development of SMA Actuated Morphing Airfoil for Wind Turbine Load Alleviation", The TMS Middle East – Mediterranean Materials Congress on Energy and Infrastructure Systems, Doha, Qatar, January 11-14, 2015.
8. Karakalas A., Machairas T., Solomou A., Riziotis V. and Saravanos D., "Morphing Airfoil with Shape Memory Alloy Wire Actuators for Active Aerodynamic Load Control in Large Wind-Turbine Blades", European Wind Energy Association, EWEA 2015 Annual Event Conference, Paris, November 17-20, 2015.

Professional Affiliations

- Member of Technical Chamber of Greece since 2010

Research Interests

- Design and Optimization of Adaptive Structures
- Adaptive Structures Activated by Shape Memory Alloys
- Experimental Characterization of Shape Memory Alloys
- Structural Mechanics
- Development of control systems
- Fluid-Structure Interactions

General Activities

- Mountain Biking
- Scuba diving
- Running
- Photography