



# Dr. Theoklis Nikolaidis

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**Thermal Engines Lab – Lead**

Division of Energy, Aeronautics & Environment  
Department of Mechanical Engineering and Aeronautics  
University of Patras / Greece



## PERSONAL STATEMENT

Associate Professor in Gas Turbine Engineering and Thermal Engines Lab Lead in the Department of Mechanical Engineering and Aeronautics at the University of Patras since August 2024. Gained strong research skills, initially as a PhD graduate, a lecturer, and later, as a Reader at Cranfield University. With a primary specialisation on Gas Turbine Engine Performance and Numerical Simulation, Theoklis has also gained significant experience in postgraduate education as Programme Director of the "Thermal Power and Propulsion" MSc course, up until his departure from Cranfield in July 2024.

Extensive industrial and academic experience on gas turbine engineering covering the areas of:

- Engine design, performance analysis and advanced methods for modelling-simulation (e.g., steady state & transient performance, variable geometry, novel cycles, use of alternative fuels)
- Aircraft - Engine Integration and flight mission analysis
- Aircraft – Engine Thermal Management
- Engine Diagnostics and Engine Health Monitoring (EHM)
- Environmental impact of civil aviation jet engines

Ambition is to develop further a broad-based academic career including teaching, research, and management responsibilities. Previous academic and work experience as an aircraft engineer has enabled the development of outstanding communication skills with fluency in Greeks and English. Adaptable, resilient and a competent problem solver, leading by example. Natural ability to build relationships with people at all levels.

## EDUCATION

**Fellow of the Higher Education Academy, UK Professional Standards Framework for teaching and learning support in higher education, HEA, UK (April 2016)**

### **PhD Gas Turbine Performance: Cranfield University, UK (October 2003 - October 2008)**

Investigation of rain ingestion effects on gas turbine performance. Running it as a part time student, successfully developed a new numerical method to account for water ingestion effects.

### **MSc Thermal Power: Cranfield University, UK (October 2002 - September 2003)**

- **Modules:** Gas Turbine Performance, Simulation and Diagnostics, Turbomachinery, Mechanical design of Turbomachinery, Blade Cooling, Fuels and Combustion, Combustors, Management for technology, Engine Systems.
- **Individual Thesis:** Investigation of water ingestion effects on gas turbine engine: The project aimed to investigate the parameters affecting engine's performance under rainy operating conditions and identifying the critical parameters and their impact on engine's performance.

**BA (Hons) Aeronautical Engineering: Hellenic Air Force Academy, Greece (September 1987 - June 1991)**

## RESEARCH PROJECTS & PUBLICATIONS

### PI in the following research projects (not exhaustive):

- FETCH: Future Engine Technology for the Control of Hydrogen (Innovate UK/ATI -- Lead partner: Moog UK)
- UHBR Engine Thermal Management (Innovate UK/ATI -- Lead partner: Meggitt plc)
- Development of a gas turbine performance diagnostic capability for gas turbine engines (industrial sponsor)
- TwinGen- prototyping of world's most compact heat and power boiler – micro gas turbine (Innovate UK)

### Co-I in the following research projects:

- ZEST: Zero Emission Sustainable Systems - (Innovate UK/ATI – WP leader – Lead partner: Airbus)
- EFFICIENT - Horizon 2020 / Clean Sky JU, Environment Friendly Fire Suppression for Cargo using Innovate Green Technology
- Gas turbine performance simulation software development / (industrial sponsor)

### Journal Publications:

More than 90 papers published in scientific journals.

### Indicative list:

1. Gao, X., A. Isoldi, D. Nalianda, and T. Nikolaidis. "Water Extraction in Aero Gas Turbines for Contrail Mitigation." *The Aeronautical Journal* 128, no. 1325 (2024): 1344–61. <https://doi.org/10.1017/aer.2024.22>
2. Mourouzidis, C., G. Singh, X. Sun, J. Huete, D. Nalianda, T. Nikolaidis, V. Sethi, A. Rolt, E. Goodger, and P. Pilidis. "Abating CO2 and Non-CO2 Emissions with Hydrogen Propulsion." *The Aeronautical Journal* 128, no. 1325 (2024): 1576–93. <https://doi.org/10.1017/aer.2024.20>.
3. Ouyang, Z., Nikolaidis, T., and Jafari, S. (2024). "Integrated Power and Thermal Management System for A Hybrid-Electric Aircraft: Integrated Modeling and Passive Cooling Analysis." *ASME. J. Eng. Gas Turbines Power*. November 2024; 146(11): 111024. <https://doi.org/10.1115/1.4066050>
4. Batra A, Sampath S, Nikolaidis T & Pilidis P (2023) Techno-economic model-based design space exploration of 'combined' ship propulsion systems, *Journal of Marine Science and Technology*, 28 (1) 288-313, DOI: 10.1007/s00773-022-00917-2.
5. Nikolaidis T, Pellegrini A, Saravanamuttoo HH, Aslanidou I, Kalfas A & Pilidis P (2022), Off-design performance comparison between single and two-shaft engines part 1 - fixed geometry, *Journal of Engineering for Gas Turbines and Power*, 144 (8) Article No. 081006, DOI: 10.1115/1.4054749.
6. Wei Z, Zhang S, Jafari S & Nikolaidis T (2022) Self-enhancing model-based control for active transient protection and thrust response improvement of gas turbine aero-engines, *Energy*, 242 (March) Article No. 123030, DOI: 10.1016/j.energy.2021.123030
7. van Heerden, ASJ.; Judt, DM; Jafari, S; Lawson, CP; Nikolaidis, T; Bosak, D, "Aircraft thermal management: Practices, technology, system architectures, future challenges, and opportunities", *Progress in Aerospace Sciences*, Volume: 128, DOI: 10.1016/j.paerosci.2021.100767, JAN 1 2022
8. Alrashed, M; Nikolaidis, T; Pilidis, P; Jafari, S; Alrashed, W; "Key performance indicators for turboelectric distributed propulsion", *International Journal of Productivity and Performance Management*, Volume71, Issue 5, Page1989-2008, DOI10.1108/IJPPM-02-2020-0081, MAY 2022
9. Rick Hackney, Theoklis Nikolaidis, Alvise Pellegrini, A method for modelling compressor bleed in gas turbine analysis software, *Applied Thermal Engineering*, Volume 172, 2020, 115087, ISSN 1359-4311, <https://doi.org/10.1016/j.applthermaleng.2020.115087>.
10. Igie, U., Abbondanza, M., Szymański, A., & Nikolaidis, T. (2020). Impact of compressed air energy storage demands on gas turbine performance. *Proceedings of the Institution of Mechanical Engineers, Part A: Journal of Power and Energy*. <https://doi.org/10.1177/0957650920906273>
11. Theoklis Nikolaidis, Haonan Wang, Panagiotis Laskaridis, Transient modelling and simulation of gas

turbine secondary air system, *Applied Thermal Engineering*, Volume 170, 2020, 115038, ISSN 1359-4311, <https://doi.org/10.1016/j.applthermaleng.2020.115038>.

12. Nikolaidis T, Li Z, Jafari S. Advanced Constraints Management Strategy for Real-Time Optimization of Gas Turbine Engine Transient Performance. *Applied Sciences*. 2019; 9(24):5333.
13. Nikolaidis Th & Pilidis P, The effect of water ingestion on an axial flow compressor performance, *Proceedings of the Institution of Mechanical Engineers Part G-Journal of Aerospace Engineering*, 2014, Vol. 228(3) 411–423.
14. Lokesh, Kadambari; Sethi, Vishal; Nikolaidis, Theoklis; Goodger, Eric; Nalianda, Devaiah; "Life cycle greenhouse gas analysis of biojet fuels with a technical investigation into their impact on jet engine performance", *Biomass and Bioenergy*, Volume 77, June 2015, Pages 26–44, doi:10.1016/j.biombioe.2015.03.005.
15. Panagiotis Giannakakis, Panagiotis Laskaridis, Theoklis Nikolaidis, and Anestis I. Kalfas. "Toward a Scalable Propeller Performance Map", *AIAA / Journal of Propulsion and Power*, (2015) 31:4, 1073-1082, doi: 10.2514/1.B35498.
16. Lorenzo Talluri, Devaiah K Nalianda; Konstantinos G Kyprianidis; Theoklis Nikolaidis; Pericles Pilidis, "Techno economic and environmental assessment of wind assisted marine propulsion systems", *Ocean Engineering*, July 2016, vol 121, pg 301-311, <http://dx.doi.org/10.1016/j.oceaneng.2016.05.047>.
17. Ebi A Ogiriki, Li Yiguang, & Theoklis Nikolaidis "Prediction and Analysis of Impact of TBC Oxidation on Gas Turbine Creep Life", GTP-16-1081, *Journal of Engineering for Gas Turbines and Power*, December 2016, Vol 138 (12), doi:10.1115/1.4034020.
18. Li Zhuo, Theoklis Nikolaidis, Devaiah Nalianda, "Recursive Least Squares for Online Dynamic Identification on Gas Turbine Engines", *AIAA/Journal of Guidance, Control, and Dynamics*, Volume 39, Issue 11, DOI: 10.2514/1.G000408
19. Alvise Pellegrini, Theoklis Nikolaidis, Pachidis, Stephan Köhler, "On the performance Simulation of Inter-stage Turbine Reheat", *Applied Thermal Engineering* 113 (2017) 544-553, DOI: 10.1016/j.applthermaleng.2016.10.034
20. Antonakis, A.; Nikolaidis, T.; Pilidis, P. "Multi-Objective Climb Path Optimization for Aircraft/Engine Integration Using Particle Swarm Optimization". *Appl. Sci.* 2017, 7, 469, <http://www.mdpi.com/2076-3417/7/5/469>

#### **Conference Publications:**

More than 25 papers published in scientific conference proceedings.

#### **Reviewer for several journals included:**

- ASME Turbo Expo Conference.
- AIAA Power and Propulsion Journal and Journal of Guidance, Control, and Dynamics
- Elsevier Applied Thermal Engineering
- Elsevier Aerospace Science and Technology
- IMechE Journal of Power and Energy and Journal of Aerospace Engineering
- MDPI Aerospace
- MDPI Applied Sciences

#### **Committees**

ASME Turbo Expo / Aircraft Engine committee member invited and chairing several conference sessions  
AIAA Engine Design Competition / Invited Assessor

#### **Editorial Work**

Guest editor in Journal of Applied Sciences Special Issue "Gas Turbines Propulsion and Power", [http://www.mdpi.com/journal/applsci/special\\_issues/propulsion\\_and\\_power](http://www.mdpi.com/journal/applsci/special_issues/propulsion_and_power)

Guest editor in Journal of Applied Sciences Special Issue "Gas Turbine Engine - towards the Future of Power", [http://www.mdpi.com/journal/applsci/special\\_issues/Gas\\_Turbine\\_Engine](http://www.mdpi.com/journal/applsci/special_issues/Gas_Turbine_Engine)

## CAREER HISTORY

**Associate Professor - Lead of Thermal Engines Lab in the Department of Mechanical Engineering and Aeronautics at University of Patras (August 2024 – current)**

**Reader in Propulsion Engineering Centre / Cranfield University / UK (September 2018 – July 2024)**

**Lecturer in Propulsion Engineering Centre / Cranfield University / UK (April 2012 – August 2018):**

Working full time in the following areas:

- **Research:**
  - modelling and simulation of steady state and transient performance
  - design space exploration of variable and novel cycles
  - engine degradation, health monitoring methods and life
  - Aircraft / Engine Thermal Management
  - the use of Sustainable Aviation Fuels (SAFs) and hydrogen
  - Aviation Environmental Impact
- **Education:**
  - Lecturing for Thermal Power and Propulsion MSc programme and short courses on:
    - Gas Turbine Performance Simulation
    - Propulsion System Performance Integration
    - Engine Design Group Project
  - Supervising more than 70 MSc and PhD students.
  - Reviewing research papers for ASME Turbo Expo, Journal of Power and Energy/IMECHE, Journal Guidance Control/AIAA, RAES/The Aeronautical Journal, Applied Thermal Engineering, Aerospace Science and Technology et al.
- **Leadership/Management/Administration**
  - Thermal Power and Propulsion MSc Program Director
  - Assessor of MSc courses – School's validation panel
- **Industrial projects:** being the Principal and Co-Investigator in 7 EU and UK projects.

**Aircraft Engineer / Hellenic Air Force (June 1991- March 2012)**

## SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** Fluent English and Greek (native).
- **IT Skills:** Confident IT user. Experienced with Microsoft Office, ANSYS/CFX, FORTRAN and knowledge of MATLAB.
- **Individual Interests:** Active member of a basketball club. Enjoys cycling.
- **Memberships:** ASME Aircraft Engine committee member, Fellow of the Higher Education Academy.
- **Professional/Technical training:** Several training courses about post-graduation education (available on request).