Ioannis Nikiforakis, Ph.D.

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Mechanical engineer with a strong background in combustion engines and wind turbines. I am skilled in computer-aided engineering, finite element analysis, computational fluid dynamics, applied thermodynamics, heat transfer analysis, combustion kinetics and fatigue damage determination. I want to perform novel work.

Experience

04/2025 – Present	*Dev/Research Engineer 3 – Caterpillar Inc.* Contracted to the Advanced Fluid Dynamics Team through Harvey Nash, Inc., to assess design changes in developing drivetrain infrastructure through modeling and analysis.
01/2025 - Present	*Visiting Scholar-Stony Brook University (SBU)* Developing multi-dimensional, transient, computational fluid dynamics (CFD) models of internal combustion engines (ICEs) and steady-state schemes for wind turbines at SBU's Advanced Combustion and Energy Systems (ACES) Lab, under Professor Dimitris Assanis.
05/2022-12/2024 & 05/2021-08/2021 & 05/2018-12/2020	*Research Assistant-SUNY Research Foundation* Worked in projects between SBU, corporations, and the US Government. I investigated the wake field of Sunrise Wind (wind farm) and the on-site hydrogen production through PEM electrolyzers, with WindFLO (Ørsted). Additionally, I thermodynamically optimized the design of a diesel-fed, compression-ignition (CI), rotary engine with a pre-chamber (UAV) to improve performance under various loads, through 3-D CFD simulations in CONVERGE CFD (LiquidPiston, Inc. and US Air Force). I also examined the viability of hybridized solid oxide fuel cells with ICEs. By developing 0-D and 1-D models in ANSYS Chemkin and CONVERGE Chemistry, I examined the combustion kinetics. I processed a spark-ignition, in-house ICE geometry in ANSYS SpaceClaim and CONVERGE Studio before implementing 3-D CFD model simulations in CONVERGE CFD (ARPA-E's INTEGRATE, Czero, Inc.).
08/2021-05/2022 & 01/2021-05/2021 & 08/2017-05/2018	*Teaching Assistant-SBU* Assisted in SBU's Mechanical Engineering Undergraduate Program Courses: MEC 301 Thermodynamics, MEC 305 Heat & Mass Transfer, MEC 325 Manufacturing Processes, MEC 364 Introduction to Fluid Mechanics, MEC 393 Engineering Fluid Mechanics, and MEC 398 Thermodynamics II (lectures, recitations, lab work, projects, exams, homework)
06/2013-08/2013 & 06/2012-08/2012	*Intern-HARAMIS BROS S.A.* Procured and sized equipment according to the customers' needs, as well as handled the installation and repairs at a Greek water-pump company, for two consecutive summers.

Education

Ph.D. in Mechanical Engineering, Stony Brook University (SBU), 2024
Dissertation: Understanding the Role of the Internal Combustion Engine for a Hybrid Solid Oxide Fuel Cell Power Generation System – Modeling & Simulations of Combusting H_2/CO blends, diluted with H_2O and CO_2 in ICEs

M.Sc. in Sustainable Energy Technology, Delft University of Technology (TU Delft), 2017
Thesis: Determination of Fatigue Assessment of Monopile–Based Offshore Wind Turbines through Fidelity Quantification – Modeling (AutoCAD) & Simulations (NREL's FAST v8, Bladed, in-house, MATLAB codes of TU Delft)

Diploma in Mechanical Engineering, National Technical University of Athens (NTUA), 2014
Thesis: Net Zero-Energy Buildings: A Full Review

Skills

Expert in CONVERGE CFD, Tecplot, ANSYS Chemkin, Fluent, SpaceClaim, EnSight, ParaView, Autodesk AutoCAD, FAST v8 (NREL), Bladed, Aspen Plus, SolidWorks, Microsoft 365, LaTeX, MATLAB, Python, C++, Linux, Bash, MPI
Fluent in English, Greek and French | Conversational in Dutch and Chinese (Mandarin)

Publications in Refereed Journals, Conference Proceedings and Awards

Lead author in 3 publications. Awarded the Institute for Advanced Computational Science Young Writer's Award (2024) and the Gerondelis Foundation Graduate Study Scholarship (2023). Ranked 2nd in the nationwide exams for the National Technical University's of Athens Mechanical Engineering joint B.Eng. and M.Eng. Program (2007).