George Christidis (CV)

Power Electronics Engineer, PhD

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Research interests

- DC/AC power converters
- DC/DC power converters
- Waste heat recovery systems
- Electric and Hybrid Powertrains
- Solar microinveterts and satellite power systems
- Wide bandgap devices

Work Experience

Nov 2023 — current
F1 Electronics Engineer - Audi Formula Racing GmbH
Design, development and testing of Formula 1 Electronics and Power Electronics Systems

Oct 2021 — Oct 2023
F1 Electronics Engineer - Mercedes AMG HPP
Design, development and testing of Formula 1 Electronics and Power Electronics Systems

Sep 2016 — Oct 2021
Senior Power Electronics Engineer - McLaren Applied Technologies
Design, development and testing of dc/ac and dc/dc converters for motorsport and automative applications. Hardware lead for Formula 1 Power Electronics

Jul 2011 — Sep 2016
Power Electronics Researcher - University of Patras
Participated in various EU and privately funded research projects

Jul 2010 — Aug 2010
Public Power Corporation S.A.
Kos Island Power Plant
One month summer internship

Education

Oct 2010 — Sep 2016
PhD in Electrical and Computer Engineering
University of Patras
Research Field: Power Electronics
Laboratory of Electromechanical Energy Conversion
Efficiency optimization of interleaved microinverter, based on components power loss analysis (semiconductor and magnetics) and control algorithm. Validation through simulation models and experimental prototypes

Sep 2005 — Jul 2010
Diploma (5-year degree) in Electrical and Computer Engineering
University of Patras
GPA: 7.57/10
Specialization in the area of Electronics
Thesis: "*Reconfiguration of digital signal processing units based on the changing requirements in the dynamic range*"

Languages

Greek	Native
English	Fluent
	University of Michigan, Certificate of Proficiency (C2)
French	Fluent
	Diplôme Approfondi de Langue Française (C2)
German	Basic

Research Projects

May 2012 — Feb 2016 "**UPSAT - University of Patras Satellite"**
QB50 - Cubesat
Funded by FP7
Designed, built and validated the Electrical Power System of the satellite (consisting of PV panels, battery pack and six converters) after selecting the components based on the orbit specifications and in collaboration with the other teams. Programmed the microcontroller and performed mandatory acceptance tests required by NASA and QB50.

Jul 2014 — Jun 2015 **University of Patras Open Courses**
"Digital Educational Content Development of University courses"
Funded by NSRF 2007–2013
Prepared, filmed and edited video lectures of hands-on experience with power converters and mechanical and electrical drawing using AutoCAD.

May 2012 — May 2015 **"Synergasia" 09ΣΥΝ-32-829 LESS**
"Energy Saving in Elevators"
Funded by NSRF 2007–2013
Designed and validated functional (state-space average) models of power converters in Matlab/Simulink for the derivation of the control strategy of the energy recovery system installed on the elevator and the component selection of the designed converter.

Apr 2012 — Mar 2015 **"Elevators energy models"**
Funded by KLEEMAN HELLAS S.A.
Validated the elevator mechanical behavioral model operated by the motor drive in Matlab/Simulink.

Jul 2011 — Jul 2014 **CLEAN SKY: ITD-GRC-03-004 N°287076 RENERGISE**
"Innovative management of energy recovery for reduction of electrical power consumption on fuel consumption"
Funded by Cleansky JTI - FP7
Selected the power converters topologies and component parameters and designed the control algorithm for the waste heat recovery converters through SaberRD simulations. Manufactured the converters in collaboration with Miltech SA and validated their operation based on the acceptance tests issued by Airbus Helicopters.

Teaching Experience

Oct 2010 — May 2016 **Laboratory assistant, course: Power Electronics I/II** (22B703, 22B803)
Fourth year undergraduate course
ECE department, University of Patras

Oct 2010 — May 2015 **Laboratory assistant, course: Electric Machines I/II** (22Y505, 22Y605)
Third year undergraduate course
ECE department, University of Patras

Oct 2012 — Jan 2016 **Laboratory assistant, course: Technical Drawing** (22Y111)
First year undergraduate course
ECE department, University of Patras

Technical Skills

- **Tools**: Mathematica, Matlab/Simulink, Altium Designer, Cadence/Orcad, CATIA, SolidWorks
- **Embedded systems**: STM32, dsPIC, TI Delfino, Zynq ARM, VHDL/Verilog for FPGA
- **Simulation softwar**e: Spice, SaberRD, PSIM, SIMetrix, Ansys FEM

Member of Scientific and Technical Chambers

Member of Technical Chamber of Greece - Licensed Professional Engineer (No: 127628)

Member of of Institute of Electrical and Electronics Engineers (No: 91077047)
(Member of the Power Electronics Society)

Publications

Issued patent

1. WO 2020/104803 A1: "RECTIFIER BASED POWER SWITCH," 28 May 2020

Journal articles

1. G. C. Christidis, A. Ch. Nanakos, E. C. Tatakis, "Optimal Design of a Flyback Microinverter Operating under Discontinuous-Boundary Conduction Mode (DBCM)," *Energies*, vol. 14, no. 22, Nov. 2021.
2. S. P. Syrigos, G. C. Christidis, T. P. Mouselinos, E. C. Tatakis, "A non-isolated DC-DC converter with low voltage stress and high step-down voltage conversion ratio," *IET Power Electronics*, vol. 14, no. 4, pp. 1219-1235, Mar. 2021.
3. G. C. Christidis, A. Ch. Kyritsis, N. P. Papanikolaou, E. C. Tatakis, "Investigation of Parallel Active Filters' Limitations for Power Decoupling on Single Stage/Single Phase Micro-Inverters," *IEEE Journal of Emerging and Selected Topics in Power Electronics*, vol. 4, no. 3, pp. 1096-1106, Sept. 2016.
4. G. C. Christidis, A. Ch. Nanakos, E. C. Tatakis, "Hybrid Discontinuous/Boundary Conduction Mode of Flyback Microinverter for ac-PV modules," *IEEE Transactions on Power Electronics*, vol. 31, no. 6, pp. 4195-4205, June 2016.
5. A. Ch. Nanakos, G. C. Christidis, E. C. Tatakis, "Weighted Efficiency Optimization of Flyback Microinverter under Improved Boundary Conduction Mode (i-BCM)," *IEEE Transactions on Power Electronics*, vol. 30, no. 10, pp. 5548-5564, Oct. 2015.

Conference proceedings

1. G. C. Christidis, A. Ch. Nanakos, E. C. Tatakis, "Optimum Design of a Flyback PV Microinverter under Hybrid DCM/BCM Operation", *18th European Conference on Power Electronics and Applications (EPE 2016)*, 5-9 Sept. 2016.
2. G. C. Christidis, A. Ch. Nanakos, E. C. Tatakis, "Behavioral Analysis of a Flyback Inverter under Hybrid DCM-BCM Operation", *17th European Conference on Power Electronics and Applications (EPE 2015)*, 8-10 Sept. 2015.
3. S. Saridakis, N. Papanikolaou, D. Voglitsis, E. Koutroulis, E. Tatakis, G. C. Christidis, I. Karatzaferis, "Reliability Analysis for a Waste Heat Recovery Power Electronic Interface Applied at All-Electric Aircrafts," *3rd International Conference on Electrical Systems for Aircraft, Railway and Ship Propulsion (ESARS'15)*, 3-5 Mar. 2015.
4. G. C. Christidis, I. Ch. Karatzaferis, M. Sautreuil, E. C. Tatakis , N. P. Papanikolaou, "Modeling and Analysis of an Innovative Waste Heat Recovery System for Helicopters," *15th European Conference on Power Electronics and Applications (EPE 2013)*, 3-5 Sept. 2013.
5. P. Chatzidakis, G. C. Christidis, E. C. Tatakis, "Comparative Study of MPPT Algorithms for Thermoelectric Generators," *15th European Conference on Power Electronics and Applications (EPE 2013)*, 3-5 Sept. 2013.
6. G. C. Christidis, I. Ch. Karatzaferis, I. Perpinias, M. Sautreuil, N. P. Papanikolaou, M. Loupis, I. Spanoudakis and E. C. Tatakis, "Innovative Waste Heat Recovery Systems in Rotorcrafts," *International Conference on Electrical Systems for Aircraft, Railway and Ship Propulsion (ESARS'12)*, 16-18 Oct. 2012.
7. Ap. Charalambous, G. C. Christidis and E. C. Tatakis, "Comparative Study of the dc/dc Boost Converter with SiC and Si Power Devices," *International Conference on Electrical Systems for Aircraft, Railway and Ship Propulsion (ESARS'12)*, 16-18 Oct. 2012.
8. G. C. Christidis, A. Charalambous, E. C. Tatakis, "High DC Voltage Step-up Conversion for Marine Applications," *1st International Marinelive Conference on All Electric Ship*, 3-5 June 2012, pp. 1-6.
9. E. C. Tatakis, M. Kalogeropoulou, G. C. Christidis, "Behavioral Analysis of a single-switch Step up Converter," *14th European Conference on Power Electronics and Applications (EPE 2011)*, 30 Aug.-1 Sept. 2011.
10. G. C. Christidis, Th. Stouraitis, "Design and Implementation of a Variable Word Length IDCT Processor for Energy Dissipation Reduction," *4th ECE Student Conference*, 19-20 Nov. 2010, pp. 82-85.
11. S. P. Aleiferis, A. G. Emeretlis, G. C. Christidis, "Experimental Devices for the Transmission of Analog and Digital Signal via Optical Channel," *4th ECE Student Conference*, 19-20 Nov. 2010, pp. 279-280.