



# Achilleas Bardakas

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Gender: Male Date of birth: 11/03/1991 Nationality: Greek

## WORK EXPERIENCE

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[ 01/05/2021 – Current ] **Research Associate**

***Institute of Nanoscience and Nanotechnology, NCSR "Demokritos"***

**City:** Athens

**Country:** Greece

**Main activities and responsibilities:**

- Design, fabrication and characterization of tribogenerators and nano-tribogenerators for environmental mechanical energy harvesting, "Development of Autonomous Atmospheric Recorder of Electrical Field for Ships, EFOS, (MIS-5075085), Operational Programme Competitiveness, Entrepreneurship and Innovation 2014-2020 (EPAnEK).

[ 01/11/2018 – 31/10/2019 ] **Research engineer**

***Institute of Nanoscience and Nanotechnology, NCSR "Demokritos"***

**City:** Athens

**Country:** Greece

**Main activities and responsibilities:**

- Thin film deposition and fabrication of metal-contacts for quantum devices for the grant "Experimental and theoretical study on the physical properties of low-dimensional quantum nanoelectronic systems (MIS-5021463), Greek-Russia Call for proposals for Joint R&D Projects 2017.

[ 05/2015 – 08/2016 ] **Graduate Research Assistant**

***Mechanical Engineering Technology, Purdue Polytechnic Institute, Purdue University***

**City:** West Lafayette

**Country:** United States

**Main activities and responsibilities:**

- Sensor fabrication at the Birck Nanotechnology Center, using advanced micro-fabrication technologies for the project: *Wireless Transmitter for the Monitoring of Torque on Transmission Shafts*, Center for Technology Development, Purdue University, IN.
- Sensor development and design for the project: *Wireless Transmitter for the Monitoring of Torque on Transmission Shafts*, Center for Technology Development, Purdue University, IN.
- Design of mechanical assemblies and FEA analysis of them for the project: *Design review of wheelchair lift*, BraunAbility Corp., Winamac, IN.

[ 08/2014 – 05/2015 ] **Graduate Research Assistant**

***Mechanical Engineering Technology, Purdue Polytechnic Institute, Purdue University***

**City:** West Lafayette

**Country:** United States

**Main activities and responsibilities:**

- Statistical analysis of student performance and online material usage for the project: *Towards Learning Design Principles For Learner-Centered Online Engineering Education*, Office of Professional Practice (OPP), College of Engineering.

## EDUCATION AND TRAINING

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[ 01/04/2018 – Current ] **PhD Candidate**

***University of Patras, Department of Physics, NCSR "Demokritos"***

**Address:** Athens, Greece

**Field(s) of study:** Nanotechnology

**Main subject / occupational skills covered:**

**Main Research:** Experimental and theoretical study of magnetic-strain gated transistors based on semiconducting nanowires.

- Growth of ZnO semiconducting nanostructures using a low-cost and environmental-friendly hydrothermal method for applications in electronic devices (FETs, p-n diodes, solar cells etc.) and sensors (gas, chemical, biological, magnetic etc.)
- Fabrication of micro and nano-electronic devices based on Si, thin-film ZnO and ZnO nanowires using advanced nano-fabrication methods, including electron beam and optical lithography, self and assisted nano-assembly, RIE plasma etching, thin film deposition (sputtering, e-beam evaporation) and standard silicon processing procedures. Device fabrication is performed at the cleanroom facility of the Institute of Nanoscience and Nanotechnology at NCSR "Demokritos" in Athens, Greece.
- Material characterization using Scanning Electron Microscopy (SEM), Energy Dispersive Spectroscopy (EDS), X-ray Diffraction (XRD), Atomic Force Microscopy (AFM). Optical characterization using UV-VIS, FTIR and Photoluminescence (PL) spectroscopy. Multi-physics simulation using COMSOL Multiphysics.

[ 09/2014 – 08/2016 ] **Master of Science (MSc)**

***Purdue Polytechnic Institute, Purdue University***

**Address:** Knoy Hall of Technology, 401 S. Grant St #150, 47907, West Lafayette, IN, United States

**Final grade:** 3.3/4.0

**Thesis:** Design and Fabrication of a Microelectromechanical Double-Ended Tuning Fork Strain Gauge

**Main subject / occupational skills covered:**

- Design and fabrication of a MEMS double-ended tuning fork strain gauge at Birck Nanotechnology Center (Scifres Nanofabrication Cleanroom). The MEMS device was designed and simulated using COMSOL 5.2 and it was fabricated using standard microfabrication technologies (optical lithography, e-beam metal evaporation, Deep Reactive Ion Etching etc.).

[ 09/2009 – 06/2014 ] **Mechanical Engineering Technology**

***School of Pedagogical and Technological Education (ASPETE)***

**Address:** Athens, Greece

**Field(s) of study:** Mechanical Engineering

**Final grade:** 8.13/10.00

**Thesis:** Design and implementation of a 3DOF traverse system

**Main subject / occupational skills covered:**

- Participated in the design and construction of a laboratory scale batch type air tray dryer, using modern instrumentation and data acquisition equipment.
- Created data acquisition and process control software, using LabVIEW for collecting experimental data from sensors and transducers installed in a laboratory scale batch type air tray dryer.
- Participated in the simulation of the flow characteristics inside the drying chamber of the laboratory dryer using computational fluid dynamics (ANSYS Fluent).
- Designed and fabricated a traverse system used for velocity and temperature distribution measurements.

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## LANGUAGE SKILLS

**Mother tongue(s):** Greek

**Other language(s):**

**English**

**LISTENING C2 READING C2 WRITING C2**

**SPOKEN PRODUCTION C2 SPOKEN INTERACTION C2**

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## DIGITAL SKILLS

**Design Software**

Solidworks (3D) | Fusion 360 | AutoCad | Autodesk Inventor | KLayout

**Simulation Software**

Comsol Multiphysics | ANSYS

**Programming**

LabView | MathWorks MATLAB | Programmin language PYTHON

**Journal Articles**

- Kerasidou, A. P., Bardakas, A., Botzakaki, M., Georga, S. N., Krontiras, C. A., Mergia, K., Psycharis, V. P., Tsamis, C., Growth of ZnO nanowires on seeding layers deposited by ALD: The influence of process parameters, *Microelectronic Engineering*, Vol. 217, No 111091(2019)
- Prifti V., Siaraka A., Giannouli A., Segkos A., Bardakas A., Bouropoulos N., Tsamis C., Influence of Carbon Quantum Dots on the Electrical Performance of Triboelectric Generators, *Multidisciplinary Digital Publishing Institute Proceedings*, Vol. 2, No. 13, p. 1025 (2018)
- Tzempelikos, D.A., Mitrakos, D., Vouros, A.P., Bardakas, A.V., Filios, A.E. and Margaris, D.P. (2015). "Numerical modeling of heat and mass transfer during convective drying of cylindrical quince slices", *Journal of Food Engineering*, Vol. 156, pp.10-21.
- Tzempelikos, D.A., Vouros, A.P., Bardakas, A.V., Filios, A.E. and Margaris, D.P. (2015). "Experimental study on convective drying of quince slices and evaluation of thin-layer drying models", *Engineering in Agriculture, Environment and Food*, Vol. 8, Issue 3, pp.169-177.
- Bardakas, A.V., Chasiotis, V.K., Tzempelikos, D.A., Filios, A.E. (2014). "Design and implementation of a three axis digitally controlled traverse system for flow surveys in a drying chamber", *International Journal of Engineering and Technology*, Vol. 3, Issue 3, pp.350-356.
- Tzempelikos, D.A., Vouros, A.P., Bardakas, A.V., Filios, A.E. and Margaris, D.P. (2014). "Case studies on the effect of the air drying conditions on the convective drying of quinces", *Case studies in Thermal Engineering*, Vol. 3, pp.79-85.
- Tzempelikos, D.A., Vouros, A.P., Bardakas, A.V., Filios, A.E. and Margaris, D.P. (2013). "Design, construction and evaluation of a new laboratory convective dryer using CFD", *International Journal of Mechanics*, Vol. 7, Issue 4, pp.425-434.
- Tzempelikos, D.A., Vouros, A.P., Bardakas, A.V., Filios, A.E. and Margaris, D.P. (2012). "Analysis of air velocity distribution in a laboratory batch-type tray air dryer by computational fluid dynamics", *International Journal of Mathematics and Computers in Simulation*, Vol. 6, Issue 5, pp.413-421.

## CONFERENCES AND SEMINARS

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### Conference Proceedings

- Kerasidou, A. P., Bardakas, A., Botzakaki, M. A, Georga, S. N., Krontiras, C. A., Psycharis, V. P., Tsamis, C., Growth of ZnO nanowires on seeding layers deposited by Atomic Layer Deposition: The influence of process parameters, Micro & Nano 2018, 5-7 Nov., Thessaloniki (Poster)
- Prifti V., Siaraka A., Giannouli A., Segkos A., Bardakas A., Bouropoulos N., Tsamis C., Influence of Carbon Quantum Dots on the electrical performance of triboelectric generators, Eurosensors XXXII 2018, 9/09-12/09, Graz, Austria (Poster)
- Bardakas A., Zhang H. H., Leon-Salas W. D., (2017). "Design and Simulation of a Microelectromechanical Double-Ended Tuning Fork Strain Gauge", COMSOL Conference, September 15, Boston, US.
- Tzempelikos, Bardakas, A.V., Chasiotis, V.K., Filios, A.E. and Margaris, D.P. (2014). "On the development of a Laboratory scale convective dryer", eRA-9, September, 22-24, Athens, Greece.
- Tzempelikos, D.A., Mitrakos, D., Vouros, A.P., Bardakas, A.V., Filios, A.E. and Margaris, D.P. (2014). "Modelling and simulation of heat and mass transfer during convective drying of cylindrical quince slices", eRA-9, September, 22-24, Athens, Greece.
- Tzempelikos, D.A., Bardakas, A.V Vouros, A.P., Filios, A.E. and Margaris, D.P. (2014). "Thin-layer drying models critical evaluation based on laboratory scale convective dryer experiments", 6th International Conference From Scientific Computing to Computational Engineering, July, 9-12, Athens/Greece.
- Tzempelikos, D.A., Bardakas, A.V., Vouros, A.P., Tsepenekas, D.G., Filios, A.E. and Margaris, D.P. (2013). "An experimental study on convective drying of quince", EENVIRO, September, 19-20, Bucharest/Romania.
- Tzempelikos, D.A., Bardakas, A.V., Vouros, A.P., Tsepenekas D.G., Chistoloukas, D.A, Filios, A.E. and Margaris, D.P. (2013). "Design, construction and performance evaluation of a new laboratory convective dryer", 5th International Conference on Experiments/Process/System Modeling/Simulation and Optimization, July, 3-6, Athens/Greece.
- Tzempelikos, D.A., Vouros, A.P., Bardakas, A.V., Filios, A.E. and Margaris, D.P. (2012). "Airflow patterns in a laboratory batch-type tray air dryer", 5th International Conference From Scientific Computing to Computational Engineering, July, 4-7, Athens/Greece.

## HONOURS AND AWARDS

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### Honours and awards

2009-2014: Greek Ministry of Finance Fellowship for Excellence in Undergraduate Education (1<sup>st</sup> through 5<sup>th</sup> year of studies; fellowship awarded through exams on 3 core science subjects).

2013: State Scholarships Foundation (IKY) Fellowship for Excellence in Undergraduate Education (for the 3<sup>rd</sup> semester of undergraduate studies)

## SCHOLARSHIPS

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[ 24/04/2018 – 24/04/2021 ] **Doctoral Scholarship**

State Scholarships Foundation (IKY) Scholarship for Doctoral Studies, Experimental and theoretical study of magnetic-strain gated transistors based on semiconducting nanowires.