

Christoforos Panteli PhD

Smart Biomedical Gas Sensing Systems, Mixed Signal Electronics | Ex-special forces lieutenant



Electrical and Electronic Engineering, Imperial College London



Education

-
- 2015-19 **PhD in Graphene-based gas and pH sensors**
Imperial College London
- Thesis Title: *Graphene inspired sensing devices*
 - **Developed Polymer Assisted Graphene Transfer (PAGT) Process**
 - **Proved** that **suspended graphene** on Silicon nanowire arrays perform better as gas sensors than when supported on solid substrates.
 - **Pioneered** plasma post-processing and graphene deposition on CMOS **Ion-Sensitive Field Effect Transistor (ISFET)**.
 - **Improved** the pH sensing performance of CMOS ISFET for **DNA sequencing** applications.
- 2011-15 **MEng and ACGI Electrical & Electronic Engineering**
Imperial College London 1st Class Honours
- Final Year Project: *A Complete ISFET - Electrolyte Interface Model and Simulation*



Professional Experience

-
- 2019- **Research Associate** Electronic Systems Manufacturing
Imperial College London in **collaboration** with **Loughborough University** and **University of Manchester** and other **Industrial Partners**
- Aim: Demonstrate on commercial electronic devices a lead-free solder quasi-ambient bond process.
 - Task: Model in COMSOL Multiphysics the thermal stress during bonding of electronic components and develop a quasi-ambient bond process with self-propagating exothermic reaction nano-materials using infrared lasers.
- 2014 **Electronic Systems Engineer** 6 month Internship
DNA Electronics Ltd
- Task: develop two decimation filters for the downsampling of the digitised signal from analog CMOS Ion-Sensitive Field-Effect Transistor (ISFET) pH sensors.
 - Designed and modelled in MALTAB a Cascaded integrator-comb (CIC) and Finite Impulse Response (FIR) digital decimation filters and implemented them on an Opal Kelly XEM6001 board with a Xilinx SPARTAN 6 FPGA in Verilog HDL.
- 2013 **Undergraduate Research Project on Power Systems** 10 weeks
Imperial College London
- Task: improve the efficiency of a cell of a lab-scale alternate arm converter (AAC).
 - Designed and tested a full H-bridge cell on a PCB using Gallium nitride devices.
 - Proven that Gallium Nitride devices have lower losses and higher efficiency for HVDC links applications.
- 07-08/2012 **Lifeguard**
Ministry of Internal Affairs, Cyprus

07-08/2011 **Lifeguard**
Ministry of Internal Affairs, Cyprus

2009-11 **Special Forces Lieutenant**
Ministry of Defence, Cyprus



Peer-reviewed Scientific Journals

1. Y. Zhong, S. Robertson, W. Mirihanage, **C. Panteli**, S. Liang, S. Ramachandran, Z. Zhou, A. Holmes, A. Yu Liu, F. Wu, S. Haigh, C. Liu, “High-speed synchrotron in situ imaging of the millisecond-timescale wetting, bubbling and cracking dynamics during self-propagating exothermic reactive bonding”, Under review, 2021
2. **C. Panteli**, P. Georgiou, K. Fobelets, “Reduced drift of CMOS ISFET pH sensors using graphene sheets”, *IEEE Sensors Journal*, vol. 21, no. 13, pp. 14609-14618, 1 July, 2021, [get article](#)
3. N. Moser, **C. Panteli**, K. Fobelets and P. Georgiou, “Mechanisms for enhancement of sensing performance in CMOS ISFET arrays using reactive ion etching”, *Sensors and Actuators B: Chemical*, vol. 292, pp. 297-307, 2019 [get article](#)
4. **C. Panteli**, P. Georgiou and K. Fobelets, “Performance Improvement of Commercial ISFET sensors using Reactive Ion Etching”, *Microelectronic Engineering*, vol. 192, pp. 61-65, 2018 [get article](#)
5. K. Fobelets, **C. Panteli**, O. Sydoruk, C.B. Li, “Ammonia Sensing using Arrays of Silicon Nanowires and Graphene”, *Journal of Semiconductors*, vol. 39 (6), pp. 063001, 2018 [get article](#)



Peer-reviewed Conference Proceedings

1. **C. Panteli**, P. Georgiou, K. Fobelets, “Graphene-coated CMOS ISFETs for pH sensing”, European Graphene Forum, Lisbon Portugal 23-25 October, 2019
2. **C. Panteli**, X. Zhu, O. Sydoruk, K. Fobelets, “Graphene on Si nanowire arrays as solvent vapour sensor”, ISTDM-ICSI Potsdam Germany, 27-31 May, 2018
3. N. Moser, **C. Panteli**, D. Ma, C. Toumazou, K. Fobelets and P. Georgiou, “Improving the pH Sensitivity of ISFET Arrays with Reactive Ion Etching”, BioCAS Turin Italy, 19-21 October, 2017
4. **C. Panteli**, N. Moser, P. Georgiou and K. Fobelets, “Optimising the Performance of Commercial ISFET sensors using Reactive Ion Etching”, Micro and Nano Engineering Conference, Braga Portugal, 18-23 September, 2017
5. **C. Panteli**, O. Sydoruk and K. Fobelets, “Graphene Suspended on Silicon Nanowire Arrays for Enhanced Gas Sensing”, 231st Electro-Chemical Society Meeting, New Orleans US, 28 May - 1 June, 2017
6. **C. Panteli**, D. Liu, O. Sydoruk and K. Fobelets, “Through-Graphene Etching of Porous Si by Electroless Metal Assisted Chemical Etching”, Micro and Nano Engineering Conference, Vienna Austria, 19-23 September, 2016



Invited Talks

- Jan 2021 **The future of non-invasive biomedical sensing**
University of Cyprus Seminar
- Sep 2020 **Non-invasive biomedical sensing**
University of Cyprus Seminar
- Dec 2017 **Suspended Graphene on Silicon nanowire arrays for gas sensing**
University of Cyprus Seminar



Prizes and Awards

- 2017 **Graduate Teaching Assistant of the Year**
Faculty of Engineering Imperial College London
- 2011-15 **Biomedical Engineering Research Scholarship**
A. G. Leventis Foundation
- 2011-15 **Doctoral Training Award**
Engineering and Physical Sciences Research Council
- 2015 **Nicholas Battersby Prize for Excellence in Analogue Electronics**
Imperial College London



Funding received so far

- 2018 **Travel Grant £400** for ISDTM-ICSI conference
Old Centralian's Trust
- 2017 **Travel Grant £300** for MNE conference
Imperial College Trust



Teaching and Supervision

- 2015- **Coursework Organiser**
Imperial College London
 - Advanced Electronic Devices MSc level
- 2015- **Teaching Assistant**
Imperial College London
 - Electronic Devices Undergraduate level
 - Analysis and Design of Circuits Undergraduate level
- 2017-18 **Supervision**
Imperial College London
 - Undergraduate Final Year Project: Xingzi Zhu **published** in ISTDM-ICSI 2018 conference
 - Undergraduate Research Project: Sara Emme



Professional Services

- 2011- Reviewer in IEEE Sensors Journal



Professional Memberships

- 2011- IEEE
2011- Institute of Engineering and Technology