



Knitted bio-sensors

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Room: XOD 02 (In the basement) – **B 107**

Location: <https://goo.gl/maps/fNWanm9Gk3PL5XTu7>

Abstract: Smart wearables come in different shapes and forms. Many, like e.g. the Apple Watch, are a commercial success. However, biosensing with smart garments like tops and socks have not yet seen the same success. Apart from sports and fitness, there is a reluctance in uptake notwithstanding the promise that continuous health observation can improve people's quality of life and reduce the cost of healthcare. Knitting is a method that has been used for many hundreds of years to make good looking, comfortable garments. In my approach, sensors are knitted and hidden within the garment. The idea is that such an approach makes the garment more ordinary and the wearer unaware of being "sensed". We have invented knitted inductive sensors for respiration and movement monitoring and optimised the structure and position of dry knitted electrodes for ECG. In this talk I will give an insight into how the sensors are made, their performance in different applications and how they can be a part of breathing training for e.g. people with lung disease. Some fun arts projects have also been done to measure and visualise emotions.

Biography: Kristel Fobelets is a Professor in Nanodevices in the Department of Electrical and Electronic Engineering of Imperial College in London, UK. She did her undergraduate degree in the Free University of Brussels, Belgium and her PhD degree with the Interuniversity Microelectronics Centre (IMEC) in Heverlee, Belgium. She then did a postdoc in Trinity College in Dublin Ireland after which she joined Imperial College London. She is an expert in the design, simulation, fabrication and testing of nanodevices such as field effect transistors, small thermoelectric energy generators and supercapacitors. A chance encounter with an undergraduate student in 2029 led to the invention of the knitted coil and from there to an interest in wearable sensors. She has been and is the senior tutor in the Department, she has been the Director of Undergraduate Studies and is now Deputy Head of the Department for Teaching. She has been a member of the College Senate for 3 consecutive terms. She worked with Christoforos for many, many years, first as teacher, then as final year project supervisor, then as PhD supervisor, then as research assistant line manager and now as research colleague and after some hard work he will show me a bit of Cyprus that I haven't seen before.