

## Department of Electrical and Computer Engineering

**Title: « A Fluoroscopic Cancer Screening Capsule For The Small Intestine »**

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**Wednesday, 4<sup>th</sup> December 2013, 17:00 – 18:30**  
**Room ΠΤΕΠ E113, Old Campus**  
**University of Cyprus**

### **Abstract:**

Early detection of cancer is crucial to the success of treatment and the survival of patients. One of the organs that present a diagnostic challenge in regards to early cancer detection is the small intestine because of its inaccessibility and convoluted structure. Though swallowable imaging capsules have been developed to address this issue, they are unsuitable for the detection of early stage or flat cancers.

The goal of the proposed research is to develop a screening capsule, designed specifically for fluorescence detection in the gastrointestinal tract. By using this capsule in conjunction with novel molecular contrast agents, which are selectively absorbed by cancerous cells, it is expected that it will be possible to detect cancers of the small intestine, at a very early stage, with high sensitivity and at low cost.

The development of such a screening capsule is extremely challenging, both in terms of optical design and electronics design, in addition to its multidisciplinary nature. On one hand the emitted light intensity of fluorescence is several orders of magnitude smaller than the excitation intensity, whilst on the other hand the power budget for the electronics is extremely low. Furthermore the information storage requirements and the limited size of the capsule are factors that make the design very difficult. Through the innovative design of mixed signal circuits, implemented on an application specific integrated circuit, it is expected that these challenges will be overcome.

### **Biography:**

Panayiota Demosthenous received her Physics Degree from the Department of Physics, Aristotelio University, Thessalonica, Greece, in 2007, with specialisation in "Electronics and Communication". During her study in Aristoteleio University, she won a number of scholarships for her excellent performance. She continued her studies at the University of Cyprus where she received her M.Sc. Degree in Physics in 2009. Her Master's thesis work was conducted in conjunction with the Electrical and Computer Engineering Department, where she is currently a Ph.D. student. Her research interests include integrated electronics for biomedical applications, mixed-signal electronics design, biocompatible fluorescent marker characterization and ingestible biofluorescence detection systems.