

«New technology comes at crossing disciplines»

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Room: XΩΔ02-013

Abstract: This seminar will tell the story of how a physicist, a mathematician, a microbiologist, and an electronic engineer came together to tackle Urinary-Tract Infection diagnosis. By thinking out of the box and combining and transferring knowledge, new ideas are born. This new idea is based on three facts. First, bacteria release gases when they grow in culture media. Second, electronic gas sensors are not specific but cheap and easy to integrate with microelectronics for multiple time point measurements and dynamic monitoring. Third, change-point detection (CPD), a statistical methodology, can detect changes in the mean or slope of a time-series signal at low computational cost despite noisy data. Putting all three facts together, off-the-shelf gas sensors were used to monitor the released gases in culture dishes during bacterial growth. CPD was able to identify changes in the time-series of released gases of urinary tract infection related bacterial during growth under 10 hours. This result is significantly faster than the 24-hour duration of the current diagnostic method.

Biography: **Christoforos Panteli** received the M.Eng. degree in electrical and electronic engineering (with First Class Hons.) and the Ph.D. degree from Imperial College London, London, U.K., in 2015 and 2019, respectively. He is currently a Marie Skłodowska Curie Actions Fellow with the University of Cyprus, Nicosia, Cyprus, where he is developing a gas sensing system for the diagnosis of sepsis via exhaled breath. He is also a Visiting Researcher with Imperial College London. He has developed the suspended graphene gas sensor using polymer-assisted transfer process. He pioneered the plasma post-processed and graphene-coated CMOS ISFET pH sensors delivering significantly improved performance. He contributed on environmentally friendly manufacturing techniques using nano materials for hermetic sealing for electronic devices. He also developed read-out electronics for wearable smart textile sensors to monitor breath via thorax expansion. His research interests include breath monitoring via physical and chemical approaches using mixed signal microelectronics and sensors. He is an Associate Member of the IET and has been a Young Professionals Member of IEEE since 2015.