Doctor of Philosophy, PhD subject

Nanostructured electronic nose for monitoring environmental contamination and medical diagnostics

There is an ever-rising demand of highly selective and sensitive analytical techniques in a number of fields of analytical and physical chemistry, medical diagnostics biotechnology and environmental pollution control. The prime requirements are real-time label-free monitoring, user-friendly, reliable, miniaturized and economical. The major problem in the practical use of sensor technology is the lack of high sensitivity (few ppb) and selectivity and to lower the power consumption of these sensor systems. Development of fully autonomous chemical sensing systems for volatile organics and other carcinogenic gas identification and quantification is a real big challenge. The thesis objective aims at overcoming existing limitations of E-nose systems through integration of two orthogonal electronic sensing platforms: surface acoustic wave sensor (SAW) and field-effect transistor (FET) where high sensitivity and selectivity is achieved through the use of functionalized carbon nanotubes (CNTs). Specially, the originality of USENose project lies in the development of an innovative E-nose where acoustic and electronic detection approaches are integrated onto a substrate to achieve ultrasensitive and highly selective sensing for air quality monitoring in car interior and for diseases diagnosis (breath analysis). This thesis subject is part of a big collaboration between the NTU and CINTRA (Singapore) and University of Bordeaux (France). A full 4-years scholarship is funded by the Singaporean partner (http://www.ase.ntu.edu.sg/programmes/phd/prospective-students/admissions).

PRACTICAL INFORMATION

Entry requirements: Candidates should have a minimum first or upper second class honours degree (or equivalent) in a suitable branch of Engineering. We are looking for a motivated, talented student ready to deal with a multidisciplinary scientific field in the frame of this international collaboration. Good knowledge of physics and in particular electronics (design) is necessary.

Start month: The PhD would begin in August 2016 or January 2017, as the rules there, for one year in Singapore, then one year in France, before going back for the following 2 years in Singapore as PhD students in Singapore have teaching duties at the end of their PhD. Stipend of S$2,500/month after Qualifying Examination. Support 1 local and 1 overseas conferences. Funding for overseas conference is capped at S$3,000, which includes 60% support for airfare, 50% support for registration fee and 50% support for per diem allowance.

- Scholarship details:
  (http://admissions.ntu.edu.sg/graduate/scholarships/Pages/ResearchScholarship.aspx)
  For more information on the programme and application procedures, please visit the following websites:
  (1) http://admissions.ntu.edu.sg/graduate/R-Programs/Pages/default.aspx
  (2) http://www.eee.ntu.edu.sg/ProspectiveStudents/MEngPhD/Pages/MEngPhD.aspx
  International applicants applying to the Graduate Programme by Research are required to provide (a) either TOEFL or GRE score and (b) either GRE or GATE (for applicants from India only) scores. For candidates who have not taken these scores, they may sit for English Proficiency Test (EPT) and Technical Proficiency Test (TPT) in lieu of TOEFL/IELTS and GRE/GATE scores respectively.

Application deadline: 30/ 06/2016

CONTACT

Candidates should send CV, cover letter, and contact information for two references, as well as any information considered as relevant to promote the application (transcripts, ...etc), to:

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http://research.ntu.edu.sg/expertise/academicprofile/Pages/StaffProfile.aspx?ST_EMAILID=EQZHANG