



The  
University  
Of  
Sheffield.

Faculty  
Of  
Engineering.

## **Sheffield Engineering Scholarships**

### **PhD full-fees scholarship for China Scholarships Council scholars from Zhejiang University**

**Project:** *In tank liquid natural gas (LNG) composition measurement sensor using optical methods*

Deshpande and Zimmerman (2005) demonstrated a nonlinear calibration technique for multicomponent concentrated liquid mixtures with high fidelity in the inference of concentration using fibre-optic spectrometry. The chemometrics of this have been extended with some success in recent years to hydrocarbon mixtures in the gaseous phase using data mining techniques. But the extension to LNG is problematic due to lack of experimental data from fibre-optic spectrometry and a benchmark method under cryogenic storage conditions. MHT Technology, our development partner, can arrange field trials with simultaneous GC and fibre-optic spectra for nonlinear inverse methods to develop an inference algorithm. The instrumentation and software integration will use MHT Technology's expertise in LNG sensory system and monitor design. LNG storage is central to medium term UK energy policy as gas-fired power plant capacity commissioned in the 80-90s is substantial, yet the UK is becoming a net import of natural gas and particularly LNG as the North Sea supplies dwindle. LNG tank farms globally are on the rise, and particularly in the US. LNG is also an alternative automotive fuel and development in that regime is crucially dependent on sensor and instrumentation improvement.

**Supervisor:** Professor Will Zimmerman (Chemical and Process Engineering)

**Scholarship:** Sheffield Engineering scholarships cover the full cost of PhD registration fees for 3 years

**Eligibility:** Sheffield Engineering scholarships are available to students who secure a CSC scholarship. Applicants must meet the University of Sheffield English Language requirements, full details of which are available at:

[http://www.shef.ac.uk/postgraduate/info/notlive\\_dfiohmihtm.html](http://www.shef.ac.uk/postgraduate/info/notlive_dfiohmihtm.html)

**Applications:** Please send a CV together with a brief covering letter to Professor Geraint Jewell, Faculty of Engineering Director of Research and Innovation at [g.jewell@sheffield.ac.uk](mailto:g.jewell@sheffield.ac.uk) by **15<sup>th</sup> March 2009**. Include the title of the project in your covering letter and any English language test results.