Prof. James Brownjohn, University of Sheffield, UK

Professor Brownjohn joined the University of Sheffield in 2005 after periods at University of Bristol (1984-1992), Nanyang Technological University Singapore (1992-2004) and University of Plymouth (2004-2005). His academic career has revolved around experimental assessment of the performance of a range of civil structures, using full-scale dynamic testing, long-term monitoring and shaking table testing. His present research and professional interests include wind engineering, earthquake engineering, structural health monitoring (SHM), finite element model updating, vibration serviceability, system identification and biomechanics. He has published in all these areas in a number of journals. His experience with ambient vibration testing and operational modal analysis using minimal portable equipment is a complement to the forced vibration testing approach traditionally used by the Vibration Engineering Section, of which he is a member. Professor Brownjohn is involved in promoting developments in structural health monitoring through involvement in the International Society for Structural Health monitoring of Intelligent Infrastructure (ISHMII), the EU funded thematic network on Structural Assessment, Monitoring and Control (SAMCO) and the ASCE Committee on Structural Identification of Constructed Systems. Professor Brownjohn is responsible for development and promotion of the Earthquake and Civil Engineering Dynamics (ECED) MSc course and is a founding director of Full Scale Dynamics Ltd, a University spin-out company.

Keynote abstract:

Simple but effective SHM: The skeptic-practitioner view of what works well, what doesn't and where we should direct our efforts

Applications of SHM in the real world of civil infrastructure are still relatively few because of the difficulty in making a convincing case that it will provide a cost effective and reliable solution to a stakeholder requirement. That requirement may be evaluating the need for and subsequent effectiveness of a retrofit, assuring operational safety of a structure during extreme loading, diagnosing (vibration) serviceability problems and generally proving a structure is fit for purpose and operating within the design performance 'envelope'. In civil structures it is hard to find anyone who will admit their structure has been saved from disaster by SHM, but the technology certainly does have the capability to identify anomalous performance, signalling and assisting with further structural investigation. The technology for effective SHM as defined above is available and is not necessarily dependent on complex arrays of hundreds of sensors. What works well is often simple and inexpensive if deployed appropriately; some examples will be shown. Some technologies that have not worked quite so well (for the author at least) are mentioned, along with suggestions for future research, which should perhaps focus rather more on software.