

Special Issue: Real World Application of SHM in Australia

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Australian Network of Structural Health Monitoring (ANSHM) was established in 2009 to promote and advance the field of SHM in Australia and the association has grown considerably since then. By November of 2018, ANSHM has the membership made of 45 organisations including 20 universities, 16 private companies, 6 road authorities and 3 research institutions. Every year ANSHM organises an annual workshop and/or conference sessions for members to exchange their research and practical developments in SHM. One edited book¹ and nine journal special issues have been produced since the establishment of ANSHM. One of these special issues was organised in Structural Health Monitoring - an International Journal (SHMIJ) in 2014².

On 6–7 December 2017, ANSHM held its 9th annual workshop as part of the prestigious 8th International Conference on Structural Health Monitoring of Intelligent Infrastructures (SHMII-8) in Brisbane, Queensland, Australia. The main focus of both SHMII-8 and the 9th ANSHM workshop was SHM in real-world application. Interestingly, all sessions of SHMII-8 and ANSHM workshop were held within the P block building at Gardens Point Campus of Queensland University of Technology (QUT) that was instrumented with Australia's first ever long-term full-scale SHM system³. Inspired by this theme and high-quality presentations at the workshop, a special issue named "Real World Application of SHM in Australia" was established in SHMIJ and the 9th ANSHM workshop speakers were invited to submit enhanced and extended versions of their papers to this Special Issue. After rigorous pre-screening, peer review and revision processes, fourteen papers were accepted for inclusion in the Special Issue. The contributions include deterioration assessment of the instrumented P block building at QUT using hybrid model updating and long-term vibration monitoring data⁴, reliability-based load-carrying capacity assessment of bridges using SHM and non-linear analysis⁵, and innovative vibration based damage identification methods with applications to cable-stayed, steel-truss or timber bridges⁶⁻⁹ as well as to frame, utility-pole or building structures¹⁰⁻¹². The Special

Issue also includes new research on non-destructive evaluation of (i) incipient pitting corrosion in reinforced concrete structures¹³, (ii) gaps between carbon fibre reinforced polymer composite and concrete surfaces¹⁴, (iii) fatigue cracks in pipes¹⁵, (iv) bolted joints¹⁶, and (v) in-situ stress¹⁷. Most studies were verified on real civil structures or large-scale laboratory models well reflecting the high applicability of the developed methods to solve real-world problems.

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