

Scott McGovern

Qualifications:

BE (Hons) Mechatronics ANU,
PhD Candidate (submitted March 2007)

Research interests:

Scott completed his undergraduate degree in Engineering at the Australian National University in Canberra. His studies concentrated on engineering design, focussing on areas such as mechanics, electronics and materials engineering.

Postgraduate studies were undertaken at the University of Wollongong investigating two main factors: the strength of adhesives for marine based applications, and the development of miniature conducting polymer based sensors to understand further the breakdown mechanisms with adhesives in these environments.

Current Interests

- **Modelling of the Actuation Mechanisms in Polypyrrole Actuators**

The actuation of polypyrrole based actuators suffer from the phenomenon of ‘creep’: *a continued forward movement of the actuator with an applied voltage after a short-term steady state has been reached*. This variability can make the final end-point position of these actuators hard to control, limiting the usefulness of these devices for certain applications.

A system is currently being investigated with the means to improve the positional accuracy of polypyrrole actuators to open further applications for these devices.

- **Development of Robotic Fish Device**

One of the current limitations of the polypyrrole tri-layer actuators is the maximum force output that may be achieved using existing geometries. This can limit the use of these artificial muscles within devices that are exposed to gravity and other frictional forces. Investigations are currently being undertaken in collaboration with DSTO into the use of polypyrrole artificial muscles to power a robotic fish mobile sensing device where neutral buoyancy may be realised and the frictional forces minimised. Significant advances have been made such that optimisation of the current fish geometry is being undertaken.

Memberships:

ARCNN
Australian Institute of Engineers

5 key publications:

1. McGovern, Scott T.; Spinks, Geoffrey M.; Wallace, Gordon



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Figure 1: Prototype Robotic fish with polypyrrole tri-layer actuators.

- G. The use of embedded sensors for the monitoring of adhesive joints in marine environments. Proceedings of SPIE-The International Society for Optical Engineering (2005), 5770(Advanced Sensor Technologies for Nondestructive Evaluation and Structural Health Monitoring), 76-87.
2. McGovern, Scott T.; Spinks, Geoffrey M.; Wallace, Gordon G. Micro-humidity sensors based on a processable polyaniline blend. Sensors and Actuators, B: Chemical (2005), B107(2), 657-665.
 3. McGovern, Scott T.; Spinks, Geoffrey M.; Wallace, Gordon G. Highly processable method for the construction of miniature conducting polymer moisture sensors. Proceedings of SPIE-The International Society for Optical Engineering (2005), 5649(Pt. 2, Smart Structures, Devices, and Systems II), 607-615.
 4. Scott T. McGovern, Geoffrey M. Spinks, Gordon G. Wallace, Simple method for construction of processable conducting polymer micro humidity sensors ICSM 04: The role and impact of Nonoscience & Nanotechnologies, IPRI - University of Wollongong, Australia, (2004) pp.186.
 5. McGovern, S.; P-Y Ben Jar, The use of a low pressure compression transfer moulding to enhance the fibre volume fraction of composite materials, Advanced Composite Letters, (1999), 6 (8)

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