

Name: **Alexander LANZON**

Citizenship: Maltese (EU), Australian (since 2005), Italian (since 2007)

Languages: Maltese, English and Italian (fluent); French (limited)

Family Status: Married (in 2001) with two daughters (born in 2003, 2006)

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EDUCATION

- ⇨ **Ph.D. degree** (Oct 1997 – Oct 2000) in Control Engineering, *University of Cambridge*, UK.
- ⇨ **Masters' degree** (Oct 1996 – Sep 1997) in Robot Control, *University of Cambridge*, UK.
- ⇨ **B.Eng.(Hons) degree** (Oct 1991 – Jun 1995) in Electrical and Electronic Engineering (First Class Honours), *University of Malta*, Malta.

PRESENT APPOINTMENTS

- ⇨ **Reader in Control Engineering** (Jan 2011 to date) at the School of Electrical and Electronic Engineering, *University of Manchester*, UK.
- ⇨ **Autonomous Systems Theme Leader** (Jun 2010 to date) at the Aerospace Research Institute, *University of Manchester*, UK.

PAST APPOINTMENTS

University Positions:

- ⇨ **Senior Lecturer** (Dec 2006 – Dec 2010) at the School of Electrical and Electronic Engineering, *University of Manchester*, UK.
- ⇨ **Senior Lecturer and Fellow** (Jul 2004 – Dec 2006) at the College of Engineering and Computer Science, *Australian National University*, Australia.
- ⇨ **Australian Research Council research fellowship** (May 2003 – May 2006) at the College of Engineering and Computer Science, *Australian National University*, Australia.
- ⇨ **Lecturer and Research Fellow** (Mar 2002 – Jun 2004) at the College of Engineering and Computer Science, *Australian National University*, Australia.

- ⇨ **Postdoctoral Research Associate** (Jan 2001 – Oct 2001) at the School of Aerospace Engineering, *Georgia Institute of Technology*, USA.
- ⇨ **Research Assistant** (Jun 1994 – Sep 1994) at the Underwater Robotics and Submersibles group, *Bauman Moscow State Technical University*, Russia.

Industrial Positions:

- ⇨ **Senior Research Scientist** (Jan 2005 – Dec 2006) at *National ICT Australia Ltd.*, Australia. Developed convex algorithms for model approximation using only magnitude or phase data.
- ⇨ **Research Scientist** (Jul 2003 – Dec 2004) at *National ICT Australia Ltd.*, Australia. Developed commercial algorithms for fast numerical electronic processing.
- ⇨ **Test and Product Engineer** (Oct 1995 – Sep 1996) at *ST-Microelectronics Ltd.*, Malta. Analysed electrical and process defects in commercial semiconductor Integrated Circuit devices.
- ⇨ **Control Engineer** (Jun 1995 – Sep 1995) at *Yaskawa Denki (Tokyo) Ltd.*, Japan. Tested the performance of Programmable Logic Controllers and Motion Controllers on robotic manipulators.

SUBSTANTIVE VISITING APPOINTMENTS

- ⇨ **Visiting Researcher** (Oct 2001 – Mar 2002), *University of Cambridge*, UK. Developed robust stability algorithms for non-polytopic parameter-dependent systems.

A. RESEARCH CONTRIBUTIONS

PEER-REVIEWED PUBLICATIONS

Overall number of papers is 120, broken-down as:

- 44 articles published (or in press) in journals,
- 2 articles published in peer-reviewed books,
- 59 articles published (or in press) in peer-reviewed conferences, plus
- 15 papers under review for publication as journal and conference articles.

Peer-reviewed Journal Articles:

- [P1] Xiong, J., Petersen, I. R. and Lanzon, A., “Finite frequency negative imaginary systems”, *IEEE Transactions on Automatic Control*, In press.
- [P2] Carrasco, J., Heath, W. P. and Lanzon, A., “Factorization of multipliers in passivity and IQC analysis”, *Automatica*, In press.
- [P3] Xiong, J., Petersen, I. R. and Lanzon, A., “On lossless negative imaginary systems”, *Automatica*, In press.
- [P4] Carrasco, J., Heath, W. P., Li, G. and Lanzon, A., “Comments on “On the existence of stable, causal multipliers for systems with slope-restricted nonlinearities””, *IEEE Transactions on Automatic Control*, In press.

- [P5] Lanzon, A., Engelken, S., Patra, S. and Papageorgiou, G., “Robust stability and performance analysis for uncertain linear systems — The distance measure approach”, *International Journal of Robust and Nonlinear Control*, In press.
- [P6] Osinuga, M., Patra, S. and Lanzon, A., “An iterative algorithm for maximizing robust performance in \mathcal{H}_∞ loop-shaping design”, *International Journal of Robust and Nonlinear Control*, In press.
- [P7] Osinuga, M., Patra, S. and Lanzon, A., “State-space solution to weight optimization problem in \mathcal{H}_∞ loop-shaping control”, *Automatica*, Vol. 48, No. 3, pp. 505–513, Mar 2012.
- [P8] Song, Z., Lanzon, A., Patra, S. and Petersen, I. R., “Robust performance analysis for uncertain negative-imaginary systems”, *International Journal of Robust and Nonlinear Control*, Vol. 22, No. 3, pp. 262–281, Feb 2012.
- [P9] Pettazzi, L. and Lanzon, A., “Simultaneous optimization of performance weights and a controller in mixed- μ synthesis”, *Automatica*, Vol. 48, No. 1, pp. 115–120, Jan 2012.
- [P10] Mabrok, M. A., Kallapur, A. G., Petersen, I. R. and Lanzon, A., “Generalized negative imaginary lemma for descriptor systems”, *Journal of Mechanics Engineering and Automation*, Vol. 2, No. 1, pp. 17–21, Jan 2012.
- [P11] Lana, D. Y., Patra, S. and Lanzon, A., “A parametrization of parahermitian matrix functions and its application to a state-space solution for μ -analysis”, *Systems and Control Letters*, Vol. 60, No. 10, pp. 798–806, Oct 2011.
- [P12] Crowther, B., Lanzon, A., Maya-Gonzalez, M. and Langkamp, D., “Kinematic analysis and control design for a non planar multirotor vehicle”, *AIAA Journal of Guidance, Control and Dynamics*, Vol. 34, No. 4, pp. 1157–1171, Jul 2011.
- [P13] Patra, S. and Lanzon, A., “Stability analysis of interconnected systems with ‘mixed’ negative-imaginary and small-gain properties”, *IEEE Transactions on Automatic Control*, Vol. 56, No. 6, pp. 1395–1400, Jun 2011.
- [P14] Lanzon, A., Song, Z., Patra, S. and Petersen, I. R., “A strongly strict negative-imaginary lemma for non-minimal linear systems”, *Communications in Information and Systems*, Vol. 11, No. 2, pp. 139–152, 2011.
- [P15] Osinuga, M., Patra, S. and Lanzon, A., “Smooth weight optimization in \mathcal{H}_∞ loop-shaping design”, *Systems and Control Letters*, Vol. 59, No. 11, pp. 663–670, Nov 2010.
- [P16] Engelken, S., Patra, S., Lanzon, A. and Petersen, I. R., “Stability analysis of negative imaginary systems with real parametric uncertainty — The single-input single-output case”, *IET Control Theory and Applications*, Vol. 4, No. 11, pp. 2631–2638, Nov 2010.
- [P17] Petersen, I. R. and Lanzon, A., “Feedback control of negative-imaginary systems”, *IEEE Control Systems Magazine*, Keynote Survey Article, Vol. 30, No. 5, pp. 54–72, Oct 2010.
- [P18] Xiong, J., Petersen, I. R. and Lanzon, A., “A negative imaginary lemma and the stability of interconnections of linear negative imaginary systems”, *IEEE Transactions on Automatic Control*, Vol. 55, No. 10, pp. 2342–2347, Oct 2010.
- [P19] Song, Z., Lanzon, A., Patra, S. and Petersen, I. R., “Towards controller synthesis for systems with negative imaginary frequency response”, *IEEE Transactions on Automatic Control*, Vol. 55, No. 6, pp. 1506–1511, Jun 2010.

- [P20] Lanzon, A., Feng, Y., Anderson, B. D. O. and Rotkowitz, M., “Response to comments on ‘Computing the positive stabilizing solution to algebraic Riccati equations with an indefinite quadratic term via a recursive method’”, *Applied and Computational Mathematics*, Vol. 8, No. 2, p. 270, 2009.
- [P21] Dehghani, A., Lecchini-Visintini, A., Lanzon, A. and Anderson, B. D. O., “Validating controllers for internal stability utilizing closed-loop data”, *IEEE Transactions on Automatic Control*, Vol. 54, No. 11, pp. 2719–2725, Nov 2009.
- [P22] Pettazzi, L., Lanzon, A., Theil, S. and Ercoli Finzi, A., “Design of robust drag-free controllers with given structure”, *AIAA Journal of Guidance, Control and Dynamics*, Vol. 32, No. 5, pp. 1609–1621, Sep/Oct 2009.
- [P23] Lanzon, A. and Papageorgiou, G., “Distance measures for uncertain linear systems: A general theory”, *IEEE Transactions on Automatic Control*, Vol. 54, No. 7, pp. 1532–1547, Jul 2009.
- [P24] Griggs, W. M., Lanzon, A. and Anderson, B. D. O., “A test for stability robustness of linear time-varying systems utilizing the linear time-invariant ν -gap metric”, *International Journal of Robust and Nonlinear Control*, Vol. 19, No. 9, pp. 986–1015, Jun 2009.
- [P25] Lanzon, A., “Editorial: Directions, Applications and Methods in Robust Control”, *Optimal Control, Applications and Methods*, Vol. 30, No. 3, pp. 223–224, May/Jun 2009.
- [P26] Anderson, B. D. O., Lanzon, A., Dehghani, A. and Bombois, X., “Quantitative effects of weight adjustments in \mathcal{H}_∞ control”, *Optimal Control, Applications and Methods*, Vol. 30, No. 3, pp. 267–286, May/Jun 2009.
- [P27] Griggs, W. M., Anderson, B. D. O., Lanzon, A. and Rotkowitz, M., “Interconnections of nonlinear systems with ‘mixed’ small gain and passivity properties and associated input-output stability results”, *Systems and Control Letters*, Vol. 58, No. 4, pp. 289–295, Apr 2009.
- [P28] Lanzon, A., Feng, Y., Anderson, B. D. O. and Rotkowitz, M., “Computing the positive stabilizing solution to Algebraic Riccati Equations with an indefinite quadratic term via a recursive method”, *IEEE Transactions on Automatic Control*, Vol. 53, No. 10, pp. 2280–2291, Nov 2008.
- [P29] Lanzon, A. and Petersen, I. R., “Stability robustness of a feedback interconnection of systems with negative imaginary frequency response”, *IEEE Transactions on Automatic Control*, Vol. 53, No. 4, pp. 1042–1046, May 2008.
- [P30] Griggs, W. M., Anderson, B. D. O. and Lanzon, A., “A ‘mixed’ small gain and passivity theorem in the frequency domain”, *Systems and Control Letters*, Vol. 56, No. 9–10, pp. 596–602, Sep 2007.
- [P31] Sandberg, H., Lanzon, A., Anderson, B. D. O., “Model approximation using magnitude and phase criteria: Implications for model reduction and system identification”, *International Journal of Robust and Nonlinear Control*, Vol. 17, No. 5–6, pp. 435–461, Mar/Apr 2007.
- [P32] Dehghani, A., Lanzon, A. and Anderson, B. D. O., “ \mathcal{H}_∞ design to generalize Internal Model Control”, *Automatica*, Vol. 42, No. 11, pp. 1959–1968, Nov 2006.
- [P33] Zhang, X., Tsiotras, P. and Lanzon, A., “An approach for computing the exact stability domain for a class of LTI parameter dependent systems”, *International Journal of Control*, Vol. 79, No. 9, pp. 1046–1061, Sep 2006.
- [P34] Dehghani, A., Lanzon, A. and Anderson, B. D. O., “A two-degree-of-freedom \mathcal{H}_∞ control design method for robust model matching”, *International Journal of Robust and Nonlinear Control*, Vol. 16, No. 10, pp. 467–483, Jul 2006.

- [P35] Zhang, G. and Lanzon, A., “Relationship between poles and zeros of input-output and chain-scattering systems”, *Systems and Control Letters*, Vol. 55, No. 4, pp. 314–320, Apr 2006.
- [P36] Lecchini, A., Lanzon, A. and Anderson, B. D. O., “A model reference approach to safe controller changes in iterative identification and control”, *Automatica*, Vol. 42, No. 2, pp. 193–203, Feb 2006.
- [P37] Lanzon, A. and Tsiotras, P., “A combined application of \mathcal{H}_∞ loop shaping and μ -synthesis to control high speed flywheels”, *IEEE Transactions on Control Systems Technology*, Vol. 13, No. 5, pp. 766–777, Sep 2005.
- [P38] Lanzon, A., “Weight optimisation in \mathcal{H}_∞ loop-shaping”, *Automatica*, Vol. 41, No. 7, pp. 1201–1208, Jul 2005.
- [P39] Lanzon, A., “Pointwise in frequency performance weight optimization in μ -synthesis”, *International Journal of Robust and Nonlinear Control*, Vol. 15, No. 4, pp. 171–199, Mar 2005.
- [P40] Date, P. and Lanzon, A., “A combined iterative scheme for identification and control redesigns”, *International Journal of Adaptive Control and Signal Processing*, Vol. 18, No. 8, pp. 629–644, Oct 2004.
- [P41] Dehghani, A., Lanzon, A. and Anderson, B. D. O., “An \mathcal{H}_∞ algorithm for the windsurfer approach to adaptive robust control”, *International Journal of Adaptive Control and Signal Processing*, Vol. 18, No. 8, pp. 607–628, Oct 2004.
- [P42] Lanzon, A., Anderson, B. D. O. and Bombois, X., “Selection of a single uniquely specifiable \mathcal{H}_∞ controller in the chain-scattering framework”, *Automatica*, Vol. 40, No. 6, pp. 985–994, Jun 2004.
- [P43] Lanzon, A. and Cantoni, M. W., “On the formulation and solution of robust performance problems”, *Automatica*, Vol. 39, No. 10, pp. 1707–1720, Oct 2003.
- [P44] Lanzon, A. and Richards, R. J., “Compliant motion control for non-redundant rigid robotic manipulators”, *International Journal of Control*, Vol. 73, No. 3, pp. 225–241, Feb 2000.

Peer-reviewed and edited Book Chapters:

- [P45] Anderson, B. D. O., Lanzon, A. and Bendtsen, J., “LMI-based gain scheduled controller synthesis for a class of linear parameter varying systems”, In “Control of Uncertain Systems: Modelling, Approximation and Design”, *Lecture Notes in Control and Information Sciences*, Springer-Verlag, Eds: B. A. Francis, M. C. Smith and J. C. Willems, Vol. 329, No. 1, pp. 1–23, 2006.
- [P46] Papageorgiou, G. and Lanzon, A., “Distance measures, robust stability conditions and robust performance guarantees for uncertain feedback systems”, In “Control of Uncertain Systems: Modelling, Approximation and Design”, *Lecture Notes in Control and Information Sciences*, Springer-Verlag, Eds: B. A. Francis, M. C. Smith and J. C. Willems, Vol. 329, No. 17, pp. 317–344, 2006.

Peer-reviewed Conference Articles:

- [P47] Carrasco, J., Heath, W. P. and Lanzon, A., “Factorization of multipliers in passivity and IQC analysis”, *Proceedings of the 50th IEEE Conference on Decision and Control and European Control Conference*, Orlando, FL, USA, pp. 6054–6059, Dec 2011.
- [P48] Mabrok, M. A., Kallapur, A. G., Petersen, I. R. and Lanzon, A., “A new stability result for the feedback interconnection of negative imaginary systems with a pole at the origin”, *Proceedings of the 50th IEEE Conference on Decision and Control and European Control Conference*, Orlando, FL, USA, pp. 3753–3757, Dec 2011.

- [P49] Engelken, S., Lanzon, A. and Patra, S., “Robustness analysis and controller synthesis with non-normalized coprime factor uncertainty characterisation”, *Proceedings of the 50th IEEE Conference on Decision and Control and European Control Conference*, Orlando, FL, USA, pp. 4201–4206, Dec 2011.
- [P50] Mabrok, M. A., Kallapur, A. G., Petersen, I. R. and Lanzon, A., “Enforcing a system model to be negative imaginary via perturbation of Hamiltonian matrices”, *Proceedings of the 50th IEEE Conference on Decision and Control and European Control Conference*, Orlando, FL, USA, pp. 3748–3752, Dec 2011.
- [P51] Song, Z., Patra, S., Lanzon, A. and Petersen, I. R., “On state-space characterization for strict negative-imaginariness of LTI systems”, *Proceedings of the 50th IEEE Conference on Decision and Control and European Control Conference*, Orlando, FL, USA, pp. 453–458, Dec 2011.
- [P52] Mabrok, M. A., Kallapur, A. G., Petersen, I. R. and Lanzon, A., “A negative imaginary lemma for descriptor systems”, *Proceedings of the 2011 Australian Control Conference*, Melbourne, Australia, pp. 543–546, Nov 2011.
- [P53] Langkamp, D., Roberts, G., Scillitoe, A., Lunnon, I., Llopis-Pascual, I., Zamecnik, J., Proctor, S., Rodriguez-Frias, M., Turner, M., Lanzon, A. and Crowther, W., “An engineering development of a novel hexrotor vehicle for 3D applications”, *Proceedings of the International Micro Air Vehicle Conference*, 't Harde, The Netherlands, pp. 32–39, Sep 2011.
- [P54] Kara Mohamed, M., Patra, S. and Lanzon, A., “Designing electric propulsion systems for UAVs”, *Lecture Notes in Artificial Intelligence, Subseries of Lecture Notes in Computer Science*, Vol. 6856, Springer, Proceedings of the 12th Annual Conference Towards Autonomous Robotic Systems, Sheffield, UK, pp. 388–389, Sep 2011.
- [P55] Lanzon, A. and Patra, S., “Robust performance improvement test for stabilizing controllers using closed-loop data”, *Proceedings of the 18th IFAC World Congress*, Milan, Italy, pp. 3623–3628, Sep 2011.
- [P56] Mabrok, M., Kallapur, A. G., Petersen, I. R. and Lanzon, A., “Spectral conditions for the negative imaginary property of transfer function matrices”, *Proceedings of the 18th IFAC World Congress*, Milan, Italy, pp. 1302–1306, Sep 2011.
- [P57] Freddi, A., Lanzon, A. and Longhi, S., “A feedback linearization approach to fault tolerance in quadrotor vehicles”, *Proceedings of the 18th IFAC World Congress*, Milan, Italy, pp. 5413–5418, Sep 2011.
- [P58] Osinuga, M., Patra, S. and Lanzon, A., “Weight optimization for maximizing robust performance in \mathcal{H}_∞ loop-shaping design”, *Proceedings of the 18th IFAC World Congress*, Milan, Italy, pp. 10135–10140, Sep 2011.
- [P59] Kara Mohamed, M., Patra, S. and Lanzon, A., “Designing simple indoor navigation system for UAVs”, *Proceedings of the 19th Mediterranean Conference on Control and Automation*, Corfu, Greece, pp. 1223–1228, Jun 2011.
- [P60] Mabrok, M., Kallapur, A. G., Petersen, I. R. and Lanzon, A., “Stability analysis for a class of negative imaginary feedback systems including an integrator”, *Proceedings of the 8th Asian Control Conference*, Kaohsiung, Taiwan, pp. 1481–1486, May 2011.
- [P61] Engelken, S., Lanzon, A., Patra, S. and Papageorgiou, G., “Distance measures for linear systems with multiplicative and inverse multiplicative uncertainty characterisation”, *Proceedings of the 49th IEEE Conference on Decision and Control*, Atlanta, GA, USA, pp. 2336–2341, Dec 2010.

- [P62] Xiong, J., Petersen, I. R. and Lanzon, A., “Finite frequency negative imaginary systems”, *Proceedings of the 2010 American Control Conference*, Baltimore, MD, USA, pp. 323–328, Jun/Jul 2010.
- [P63] Osinuga, M., Patra, S. and Lanzon, A., “Incorporating smoothness into weight optimization for \mathcal{H}_∞ loop-shaping design”, *Proceedings of the 18th Mediterranean Conference on Control and Automation*, Marrakech, Morocco, pp. 856–861, Jun 2010.
- [P64] Song, Z., Lanzon, A., Patra, S. and Petersen, I. R., “Analysis of robust performance for uncertain negative-imaginary systems using structured singular value”, *Proceedings of the 18th Mediterranean Conference on Control and Automation*, Marrakech, Morocco, pp. 1025–1030, Jun 2010.
- [P65] Xiong, J., Petersen, I. R. and Lanzon, A., “On lossless negative imaginary systems”, *Proceedings of the 7th Asian Control Conference*, Hong Kong, China, pp. 824 – 829, Aug 2009.
- [P66] Petersen, I. R., Lanzon, A. and Song, Z., “Stabilization of uncertain negative-imaginary systems via state feedback control”, *Proceedings of the 2009 European Control Conference*, Budapest, Hungary, pp. 1605 – 1609, Aug 2009.
- [P67] Engelken, S., Lanzon, A. and Petersen, I. R., “ μ analysis for interconnections of systems with negative imaginary frequency response”, *Proceedings of the 2009 European Control Conference*, Budapest, Hungary, pp. 555 – 560, Aug 2009.
- [P68] Xiong, J., Petersen, I. R. and Lanzon, A., “Stability analysis of positive feedback interconnections of negative imaginary systems”, *Proceedings of the 2009 American Control Conference*, St. Louis, Missouri, USA, pp. 1855 – 1860, Jun 2009.
- [P69] Lanzon, A., Song, Z. and Petersen, I. R., “Reformulating negative imaginary frequency response systems to bounded-real systems”, *Proceedings of the 47th IEEE Conference on Decision and Control*, Cancun, Mexico, pp. 322–326, Dec 2008.
- [P70] Pettazzi, L., Lanzon, A. and Theil, S., “Design of robust decentralized controllers for drag-free satellite”, *Proceedings of the 47th IEEE Conference on Decision and Control*, Cancun, Mexico, pp. 602–607, Dec 2008.
- [P71] Lanzon, A., “An economic parametrisation for parahermitian matrix functions used in control systems optimisation”, *Proceedings of the UKACC International Conference on Control 2008*, Manchester, UK, Sep 2008.
- [P72] Pettazzi, L. and Lanzon, A., “Systematic design of optimal performance weight and controller in mixed- μ synthesis”, *Proceedings of the 17th IFAC World Congress*, Seoul, Korea, pp. 7814–7819, Jul 2008.
- [P73] Griggs, W., Anderson, B. D. O., Lanzon, A. and Rotkowitz, M., “A stability result for interconnections of nonlinear systems with ‘mixed’ small gain and passivity properties”, *Proceedings of the 46th IEEE Conference on Decision and Control*, pp. 4489–4494, New Orleans, Louisiana, USA, Dec 2007.
- [P74] Dehghani, A., Anderson, B. D. O., Lanzon, A. and Lecchini, A., “Verifying stabilizing controllers via closed-loop noisy data: MIMO case”, *Proceedings of the 46th IEEE Conference on Decision and Control*, pp. 264–269, New Orleans, Louisiana, USA, Dec 2007.
- [P75] Lanzon, A., Feng, Y. and Anderson, B. D. O., “An iterative algorithm to solve Algebraic Riccati Equations with an indefinite quadratic term”, *Proceedings of the 2007 European Control Conference*, pp. 3033–3039, Kos, Greece, Jul 2007.

- [P76] Papageorgiou, G. and Lanzon, A., “All solutions to a class of two-block μ -synthesis problems”, *Proceedings of the 2007 European Control Conference*, pp. 2464–2465, Kos, Greece, Jul 2007.
- [P77] Griggs, W. M., Anderson, B. D. O. and Lanzon, A., “A ‘mixed’ small gain and passivity theorem for an interconnection of linear time-invariant systems”, *Proceedings of the 2007 European Control Conference*, pp. 2410–2416, Kos, Greece, Jul 2007.
- [P78] Lanzon, A. and Petersen, I. R., “A modified positive-real type stability condition”, *Proceedings of the 2007 European Control Conference*, pp. 3912–3918, Kos, Greece, Jul 2007.
- [P79] Dehghani, A., Anderson, B. D. O. and Lanzon, A., “Unfalsified adaptive control: A new controller implementation and some remarks”, *Proceedings of the 2007 European Control Conference*, pp. 709–716, Kos, Greece, Jul 2007.
- [P80] Gunasinghe, I. and Lanzon, A., “A systematic weight synthesis procedure for performance optimisation in \mathcal{H}_∞ loop shaping”, *Proceedings of the 2007 European Control Conference*, pp. 223–228, Kos, Greece, Jul 2007.
- [P81] Lanzon, A., Lecchini, A., Dehghani, A. and Anderson, B. D. O., “Checking if controllers are stabilizing using closed-loop data”, *Proceedings of the 45th IEEE Conference on Decision and Control*, pp. 3660–3665, San Diego, CA, USA, Dec 2006.
- [P82] Santoso, L. and Lanzon, A., “On the modelling of a bistable genetic switch”, *Proceedings of the 45th IEEE Conference on Decision and Control*, pp. 31–36, San Diego, CA, USA, Dec 2006.
- [P83] Sandberg, H., Lanzon, A. and Anderson, B. D. O., “Transfer function approximation and identification using magnitude and phase criteria”, *Proceedings of the 17th International Symposium on Mathematical Theory of Networks and Systems*, pp. 250–256, Kyoto, Japan, Jul 2006.
- [P84] Helmke, U., Jordan, J. and Lanzon, A., “A control theory approach to linear equation solvers”, *Proceedings of the 17th International Symposium on Mathematical Theory of Networks and Systems*, pp. 1401–1407, Kyoto, Japan, Jul 2006.
- [P85] Jordan, J., Helmke, U. and Lanzon, A., “Linear equation solvers via robust and optimal control”, *Proceedings of the Joint GAMM–SIAM Conference on Applied Linear Algebra*, Düsseldorf, Germany, Jul 2006.
- [P86] Procházka, H., Lanzon, A. and Anderson, B. D. O., “Synthesis of parameter-dependent controllers yielding affine-in-parameters characteristic polynomials”, *Proceedings of the 45th IEEE Conference on Decision and Control*, pp. 5832–5838, San Diego, CA, USA, Dec 2006.
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- [P88] Lanzon, A., Anderson, B. D. O. and Bombois, X., “A Newton-Raphson algorithm for calculating the effects of changes in weights on an \mathcal{H}_∞ design”, *Proceedings of the 44th IEEE Conference on Decision and Control and the 2005 European Control Conference*, pp. 3657–3662, Seville, Spain, Dec 2005.
- [P89] Griggs, W. M., Lanzon, A. and Anderson, B. D. O., “A stability robustness test for systems with linear time-varying uncertainties”, *Proceedings of the 44th IEEE Conference on Decision and Control and the 2005 European Control Conference*, pp. 3651–3656, Seville, Spain, Dec 2005.

- [P90] Dehghani, A., Lanzon, A. and Anderson, B. D. O., “An \mathcal{H}_∞ model referencing design utilizing a two degree of freedom controller scheme”, *Proceedings of the 44th IEEE Conference on Decision and Control and the 2005 European Control Conference*, pp. 2302–2307, Seville, Spain, Dec 2005.
- [P91] Zhang, G. and Lanzon, A., “On poles and zeros of input-output and chain-scattering systems”, *Proceedings of the 16th IFAC World Congress*, Prague, Czech Republic, Jul 2005.
- [P92] Dehghani, A., Lanzon, A. and Anderson, B. D. O., “A new \mathcal{H}_∞ design method for high performance robust tracking control”, *Proceedings of the 16th IFAC World Congress*, Prague, Czech Republic, Jul 2005.
- [P93] Lecchini, A., Lanzon, A. and Anderson, B. D. O., “Safe controller changes with additional guaranteed model reference performance improvement for the unknown plant”, *Proceedings of the 43rd IEEE Conference on Decision and Control*, pp. 2692–2693, Paradise Island, Bahamas, Dec 2004.
- [P94] Dehghani, A., Lanzon, A. and Anderson, B. D. O., “The windsurfer approach to iterative control and identification using an \mathcal{H}_∞ algorithm”, *Proceedings of the 2004 IFAC Workshop on Adaptation and Learning in Control and Signal Processing*, pp. 777–782, Yokohama, Japan, Aug 2004.
- [P95] Griggs, W. M., Lanzon, A. and Anderson, B. D. O., “On Vinnicombe metrics and the stability robustness of linear time-varying systems”, *Proceedings of the 5th Asian Control Conference*, pp. 1469–1477, Melbourne, Australia, Jul 2004.
- [P96] Lecchini, A., Lanzon, A. and Anderson, B. D. O., “Safe adaptive controller changes based on reference model adjustments”, *Proceedings of the 42nd IEEE Conference on Decision and Control*, Vol. 4, pp. 4297–4302, Maui, HI, USA, Dec 2003.
- [P97] Lanzon, A., Bombois, X. and Anderson, B. D. O., “On weight adjustments in \mathcal{H}_∞ control design”, *Proceedings of the European Control Conference*, Cambridge, UK, Sep 2003.
- [P98] Lanzon, A., Anderson, B. D. O. and Bombois, X., “On uniqueness of central \mathcal{H}_∞ controllers in the chain-scattering framework”, *Proceedings of the 4th IFAC Symposium on Robust Control Design*, Milan, Italy, Jun 2003.
- [P99] Zhang, X., Lanzon, A. and Tsiotras, P., “On robust stability of LTI parameter dependent systems”, *Proceedings of the 10th Mediterranean Conference on Control and Automation*, Lisbon, Portugal, Jul 2002.
- [P100] Lanzon, A. and Tsiotras, P., “Robust control of energy-momentum wheels supported on active magnetic bearings using \mathcal{H}_∞ loop-shaping and μ -synthesis”, *Proceedings of the 15th IFAC World Congress*, Barcelona, Spain, Jul 2002.
- [P101] Date, P. and Lanzon, A., “An algorithm for joint identification and control”, *Proceedings of the American Control Conference*, Vol. 4, pp. 3325–3330, Anchorage, AK, USA, May 2002.
- [P102] Lanzon, A., “Simultaneous synthesis of weights and controllers in \mathcal{H}_∞ loop-shaping”, *Proceedings of the 40th IEEE Conference on Decision and Control*, Vol. 1, pp. 670–675, Orlando, FL, USA, Dec 2001.
- [P103] Lanzon, A. and Cantoni, M. W., “A state-space algorithm for the simultaneous optimisation of performance weights and controllers in μ -synthesis”, *Proceedings of the 39th IEEE Conference on Decision and Control*, Vol. 1, pp. 611–616, Sydney, Australia, Dec 2000.

- [P104] Lanzon, A. and Richards, R. J., “A frequency domain optimisation algorithm for simultaneous design of performance weights and controllers in μ -synthesis”, *Proceedings of the 38th IEEE Conference on Decision and Control*, Vol. 5, pp. 4523–4528, Phoenix, AZ, USA, Dec 1999.
- [P105] Lanzon, A. and Richards, R. J., “Trajectory/force control for robotic manipulators using sliding-mode and adaptive control”, *Proceedings of the American Control Conference*, Vol. 3, pp. 1940–1944, San Diego, CA, USA, Jun 1999.

Manuscripts under review:

- [P106] Lanzon, A., Freddi, A. and Longhi, S., “A fault tolerant control scheme for rotor failure in unmanned quadrotor vehicles”, *Submitted for journal publication*.
- [P107] Dehghani, A. and Lanzon, A., “Discussion on: ‘2-DOF controller design for precise positioning a spindle levitated with active magnetic bearings’”, *Submitted for journal publication*.
- [P108] Alli-Oke, R., Carrasco, J., Heath, W. and Lanzon, A., “A robust Kalman conjecture for first-order plants”, *Submitted for conference publication*.
- [P109] Mabrok, M., Kallapur, A. G., Petersen, I. R. and Lanzon, A., “A stability result on the feedback interconnection of negative imaginary systems with poles at the origin”, *Submitted for journal publication*.
- [P110] Engelken, S., Lanzon, A. and Patra, S., “Improved robustness analysis and controller synthesis for uncertain linear systems via non-normalized coprime factor uncertainty”, *Submitted for journal publication*.
- [P111] Mabrok, M., Kallapur, A. G., Petersen, I. R. and Lanzon, A., “Enforcing negative imaginary dynamics on mathematical system models”, *Submitted for journal publication*.
- [P112] Patra, S. and Lanzon, A., “A closed-loop data based test for robust performance improvement in iterative identification and control redesigns”, *Submitted for journal publication*.
- [P113] Song, Z., Lanzon, A., Patra, S. and Petersen, I. R., “A negative-imaginary lemma without minimality assumptions and robust state-feedback synthesis for uncertain negative-imaginary systems”, *Submitted for journal publication*.
- [P114] Mabrok, M., Kallapur, A. G., Petersen, I. R. and Lanzon, A., “On spectral conditions for the negative imaginary property of transfer function matrices”, *Submitted for journal publication*.
- [P115] Maya-Gonzalez, M., Carrasco, J., Lanzon, A. and Heath, W., “Search procedures for SISO Zames-Falb multipliers”, *Submitted for conference publication*.
- [P116] Carrasco, J., Maya-Gonzalez, M., Lanzon, A. and Heath, W. P., “LMI search for rational anticasual Zames-Falb multipliers”, *Submitted for conference publication*.
- [P117] Carrasco, J., Heath, W. P. and Lanzon, A., “Equivalence between classes of multipliers for slope-restricted nonlinearities”, *Submitted for conference publication*.
- [P118] Griggs, W. M., Sajja, S. S. K., Shorten, R. N. and Lanzon, A., “An eigenvalue-based characterisation of ‘mixed’ systems in discrete time”, *Submitted for journal publication*.
- [P119] Engelken, S. and Lanzon, A., “Revisiting robust stabilization of coprime factors: The general case”, *Submitted for conference publication*.
- [P120] Mabrok, M. A., Kallapur, A. G., Petersen, I. R. and Lanzon, A., “Stabilization of uncertain negative-imaginary systems using a Riccati equation approach”, *Submitted for conference publication*.

GRANTS AND CONTRACTS

Total awarded grants = £5,863,816, including:

My personal credit share on these grants: £2,504,630
(i.e. only counting my budgeted fraction on collaborative grants)

Grants awarded:

- [G1] *Regional Growth Fund, Department for Business, Innovation and Skills, UK.* “Growing Autonomous System Mission Management Applications (GAMMA)”, In collaboration with North West Aerospace Alliance Ltd., BAe Systems, National Nuclear Laboratories Ltd. and the Universities of Liverpool, Salford, Lanchester and Central Lancaster. Jan 2012 – Jan 2015. Total amount granted £4.4M, includes University of Manchester’s share of £1.52M.
- [G2] *Faculty Strategic Funds, Faculty of Engineering and Physical Sciences, University of Manchester, UK.* “Gimballed rig for hardware-in-the-loop attitude control systems testing of Unmanned Aerial and Underwater Vehicles”, In collaboration with B. Lennox, A. Stancu. Nov 2011 – Jul 2012, Amount granted £19,600.
- [G3] *Faculty Strategic Funds, Faculty of Engineering and Physical Sciences, University of Manchester, UK.* “Nano-positioning control test bed”, In collaboration with W. Heath. Nov 2011 – Jul 2012, Amount granted £17,330.
- [G4] *University of Manchester Intellectual Property Premier Fund, UK.* “Demonstration of a variable pitch hexrotor vehicle with expanded manoeuvre envelope”, In collaboration with B. Crowther. Jul 2011 – Nov 2011, Amount granted £25,000.
- [G5] *Faculty Strategic Funds, Faculty of Engineering and Physical Sciences, University of Manchester, UK.* “Small-scale research and teaching equipment”, In collaboration with R. Van Silfhout, B. Grieve, P. Dudek, P. Wright, F. Podd, C. Woodyatt, A. Lopich, A. Kachatkou. Jan 2011 – Jul 2011, Amount granted £16,500.
- [G6] *Engineering and Physical Sciences Research Council, UK.* “Absolute stability theory of feedback interconnections and robust antiwindup control design”, In collaboration with W. Heath. Sep 2010 – Sep 2013, Amount granted £500,518.
- [G7] *University of Manchester Intellectual Property Proof-of-Principle Fund, UK.* “Patented HexRotor UAV”, In collaboration with B. Crowther. May 2009 – Feb 2010, Amount granted £90,137.
- [G8] *Sellafield Remote Technology Ltd., Remote Handling Centre of Excellence, UK.* “Use of the patented Tumbleweed rotary wing vehicle to solve part of the future nuclear decommissioning challenge”, In collaboration with B. Crowther and R. Richardson. Mar 2009, Amount granted £3,000.
- [G9] *Engineering and Physical Sciences Research Council, UK.* “Advances in robust control methods and application to flying discs”, Sole investigator. Jan 2009 – Jan 2012, Amount granted £372,110.
- [G10] *AVL Powertrain UK Ltd., UK.* “Optimised car engine tuning: An adaptive control approach”, Sole investigator. Nov 2008 – Aug 2009, Amount granted £2,000.
- [G11] *Royal Society Research Grant, UK.* “Novel concepts and control challenges in Unmanned Aerial Vehicles”, Sole investigator. Oct 2008 – Apr 2010, Amount granted £15,000.
- [G12] *Royal Society Conference Grant, UK.* Sole investigator. Jul 2007, Amount granted £1,110.

- [G13] *Australian Research Council*, Australia. “Development of robust adaptive and nonlinear control methodologies”, In collaboration with B. D. O. Anderson. Jan 2006 – Dec 2008, Amount granted AU\$336,000.
- [G14] *Australian Research Council*, Australia. “Research Network on Control, Dynamics and Systems”, In collaboration with several Universities. Dec 2003 – Aug 2004, Amount granted AU\$30,000.
- [G15] *Australian Research Council*, Australia. Fellowship on Adaptive Control, Sole fellow. May 2003 – May 2006, Amount granted AU\$207,090.
- [G16] *Australian Research Council*, Australia. “Safe adaptive control”, In collaboration with B. D. O. Anderson. May 2003 – May 2006, Amount granted AU\$60,000.

STUDENT AND POSTDOCTORAL SUPERVISION

Supervisor of postdoctoral fellows: Total 3 postdocs

- ⇨ Carrasco, J. (Sep 2010 – Nov 2011), *University of Manchester*, UK.
- ⇨ Patra, S. (Jan 2009 – Jul 2011), *University of Manchester*, UK.
- ⇨ Zhang, G. (Sep 2003 – Sep 2004), *Australian National University*, Australia.

Supervisor of Ph.D. students: Total 9 students

- ⇨ Maya-Gonzalez, M. (started Sep 2010), *University of Manchester*, UK.
- ⇨ Osinuga, M. (started Jan 2009), *University of Manchester*, UK.
- ⇨ Engelken, S. (started Sep 2008), *University of Manchester*, UK.
- ⇨ Kara Mohamed, M. (started Sep 2008), *University of Manchester*, UK.
- ⇨ Song, Z. (graduated in 2011), *University of Manchester*, UK.
- ⇨ Feng, Y. (graduated in 2009), *Australian National University*, Australia.
- ⇨ Griggs, W. (graduated in 2007), *Australian National University*, Australia.
- ⇨ Dehghani, A. (graduated in 2007), *Australian National University*, Australia.
- ⇨ Zhang, X. (graduated in 2003), *Georgia Institute of Technology*, USA.

Supervisor of Masters and Undergraduate students: Total 38 students

- ⇨ M.Sc. thesis supervision: 16 students,
Jensen, R. (2004), Engelken, S. (2008), Adedeji, A. (2008), Das, S. (2009), Wu, C. H. (2009), Luo, Z. (2009), Aslam, A. (2010), Gilani, Y. (2010), Haruna, A. (2010), Ternera, P. (2010), Lana, D. (2010), Balasundaram, L. (2011), Jimoh, F. (2011), Umego, I. (2011), Ijaz, H. (2011), Hamza, A. (2011).
- ⇨ Undergraduate project supervision: 22 students,
Nguyen, T. T. (2004-2005), Perera, L. (2004-2005), Haigh, P. (2007-2008), Bush, J. (2007-2008), Ng, P. W. Y. (2008-2009), Al-Ajmy, N. (2008-2009), Nawaz, B. A. (2008-2009), Jafri, S. (2009-2010), Li, N. (2009-2010), Vo, H. D. (2009-2010), Balan, T. (2010-2011), Sajjad, S. (2010-2011), Wang, C. (2010-2011), Iqbal Hafeez, A. (2010-2011), Abou-Sabaa, M. (2011-2012), Mannan, F. (2011-2012), Master, H. (2011-2012), Ji, T. T. (2011-2012), Teo, G. (2011-2012), Mudassar, A. (2011-2012), Crossland, M. (2011-2012), Zulkipli, M. (2011-2012).

OTHER EVIDENCE OF INTERNATIONAL STANDING

Plenary and Keynote Lectures:

- ⇨ “Future Challenges in Autonomous Systems Research”, *Keynote lecture at the 2nd Consultation Workshop on Advanced Robotics and Embodied Intelligence*, Autonomous Systems and Robotics SIG, Electronics Knowledge Transfer Network, Manchester, UK, Mar 2011.
- ⇨ “Recent advances in robust control”, *Keynote lecture at the UKACC International Conference on Control 2008*, Manchester, UK, Sep 2008.

Journal Editorships:

- ⇨ Subject editor for the *International Journal of Robust and Nonlinear Control*, John Wiley and Sons.
- ⇨ Guest editor for *Optimal Control, Applications and Methods*, John Wiley and Sons.

On Organising Committees:

- ⇨ Publications Chair, *UKACC International Conference on Control 2008*, Manchester, UK, Sep 2008.

On International Programme Committees:

- ⇨ *8th International Conference on Informatics in Control, Automation and Robotics*, Noordwijkerhout, The Netherlands, Jul 2011.
- ⇨ *7th International Conference on Informatics in Control, Automation and Robotics*, Madeira, Portugal, Jun 2010.
- ⇨ *IEEE International Conference on Control Applications*, San Antonio, Texas, USA, Sep 2008.
- ⇨ *9th IFAC Workshop on Adaptation and Learning in Control and Signal Processing*, St. Petersburg, Russia, Aug 2007.

Professional Qualifications:

- ⇨ Fellow of the Institution of Engineering and Technology (IET)
- ⇨ Fellow of the Cambridge Commonwealth Trust
- ⇨ Senior Member of the Institute of Electrical and Electronic Engineers (IEEE)
- ⇨ Senior Member of the American Institute of Aeronautics and Astronautics (AIAA)

Review of Scholarly Material:

- ⇨ More than 35 grant proposals for funding by the UK and Australian *Research Councils*.
- ⇨ Two book manuscripts for publication by *Springer-Verlag*.
- ⇨ External examiner for 5 Ph.D. and M.Phil. theses in the UK and Australia.
- ⇨ More than 200 articles for publication in various journals.
- ⇨ More than 300 articles for publication in various conferences.

Expert on International Bodies:

- ⇨ Named as “Expert of international standing in Control Systems” by the Australian Research Council.

- ⇨ Used as an international expert in control engineering by the the Chinese National Science Council on the “Program for Frontier and Innovative Research”.

Plus several (>30) times Conference Session Chair at international conferences.

B. TEACHING AND LEARNING

CURRENT AND PREVIOUS TEACHING DUTIES

Lectures:

- ⇨ EEEN60114: “Optimal and Robust Control” (32 teaching hours per year in 2011 – 2012), M.Sc. course, *University of Manchester*, UK. Average class size = 60 students.
- ⇨ EEEN30002: “Engineering Analysis” (24 teaching hours per year in 2007 – 2011), 3rd year core undergraduate course, *University of Manchester*, UK. Average class size = 150 students.
- ⇨ EEEN60108: “Control Fundamentals” (18 teaching hours in 2011), M.Sc. course, *University of Manchester*, UK. Average class size = 50 students.
- ⇨ EEEN60109: “State-Space and Digital Control” (18 teaching hours in 2010), M.Sc. course, *University of Manchester*, UK. Average class size = 60 students.
- ⇨ EEEN60112: “Control Options” (16 teaching hours per year in 2009 – 2010), M.Sc. course, *University of Manchester*, UK. Average class size = 20 students.
- ⇨ EEEN41070: “Computer-based Control with Applications” (24 contact hours per year in 2008 – 2009), M.Eng. and M.Sc. core course, *University of Manchester*, UK. Class size = 40 students.
- ⇨ GSAC6026: “ \mathcal{H}_2 and \mathcal{H}_∞ Optimal Control” (12 teaching hours in 2005), *Australian National University*, Australia.
- ⇨ GSAC6029: “Model Reduction, Uncertainty and Robustness” (12 teaching hours in 2004), *Australian National University*, Australia.
- ⇨ GSAC6028: “Linear Systems Theory” (12 teaching hours in 2004), *Australian National University*, Australia. Class size = 32 students.
- ⇨ GSAC6012: “An Advanced Course in Robust Control Theory” (30 teaching hours in 2003), *Australian National University*, Australia.
- ⇨ GSAC6034: “Systems and Control” (10 teaching hours per year in 2002 – 2003), *Australian National University*, Australia. Average class size = 40 students.

Tutorials and Lab Demonstrations:

- ⇨ “M.Sc. and M.Eng. tutorials” (12 teaching hours per year in 2007 – 2011), tutorials for M.Sc. and M.Eng. Control Systems students, *University of Manchester*, UK.
- ⇨ “EEE 1st year undergraduate tutorials” (24 teaching hours per academic year in 2007 – 2010), tutorials for 1st year EEE undergraduate students, *University of Manchester*, UK.
- ⇨ “EEE 2nd year undergraduate tutorials” (24 teaching hours per academic year in 2008 – 2010), tutorials for 2nd year EEE undergraduate students, *University of Manchester*, UK.

- ⇨ “Systems Engineering and Complex Systems” reading course (10 teaching hours in 2005), *Australian National University and National ICT Australia Ltd.*, Australia.
- ⇨ “Control Systems and Signal Processing” (24 teaching hours per year in 1999 – 2002), tutorials for 3rd year undergraduate students, *University of Cambridge*, UK.
- ⇨ “Linear Systems and Control” (24 teaching hours per year in 1998 – 2001), tutorials for 2nd year undergraduate students, *University of Cambridge*, UK.
- ⇨ “Pendulum Controller” (12 teaching hours in 1999), laboratory demonstrations for 3rd year undergraduate students, *University of Cambridge*, UK.
- ⇨ “Process Control” (12 teaching hours in 1998), laboratory demonstrations for 2nd year undergraduate students, *University of Cambridge*, UK.

Plus Yearly Examination Moderation of 2 additional undergraduate courses and 2 M.Sc. course.

SUMMARY OF TEACHING PERFORMANCE

The following table provides a summary of my average teaching performance per course unit, taken from standard anonymous student feedback questionnaires. In bracket is the maximum possible score. Minimum score at the University of Manchester is -2.00.

Course No.	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
GSAC6034	5.90 (7.00)	6.60 (7.00)	Passed to others							
GSAC6012	Created in 2003	6.71 (7.00)	Passed to others							
GSAC6028	Created in 2004		5.71 (7.00)	Passed to others						
GSAC6029	Created in 2004		6.14 (7.00)	Passed to others						
GSAC6026	Created in 2005			6.00 (7.00)	Passed to others					
EEEN30002	Took over from others					1.68 (2.00)	1.76 (2.00)	1.76 (2.00)	1.89 (2.00)	1.70 (2.00)
EEEN41070	Created in 2008						1.37 (2.00)	1.50 (2.00)	Cancelled	
EEEN60112	Created in 2009							1.50 (2.00)	No result	Cancelled
EEEN60109	Created in 2010								No result	Cancelled
EEEN60108	Created in 2011									1.50 (2.00)
EEEN60114	Created in 2011									Awaiting result
Overall School Averages	N/A	N/A	N/A	N/A	N/A	1.25 (2.00)	1.29 (2.00)	1.39 (2.00)	1.10 (2.00)	1.20 (2.00)

Congratulatory letter from University Vice-President & Faculty Dean and also from the EEE Teaching & Learning Director for excellent EEEN30002 teaching performance in 2008 and 2009.

C. LEADERSHIP AND MANAGEMENT ROLES

Leadership:

- ⇨ **Autonomous Systems Theme Leader** (Jun 2010 to date), leading a faculty-wide team to exploit Autonomous Systems technologies within industry and funding bodies.
- ⇨ **Acting Head of Department** (cumulative total: 6 months), Information Engineering, Research School of Information Sciences and Engineering, Australian National University.
- ⇨ **Acting Program Leader** (cumulative total: 5 months), Systems Engineering and Complex Systems research program, National ICT Australia Ltd.

On boards and significant committees:

- ⇨ **College Advisory Board** (Feb 2006 – Dec 2006), elected on the College Advisory Board of the College of Engineering and Computer Science, Australian National University.
- ⇨ **Faculty Board** (Jun 2003 – Jan 2006), elected on the Faculty Board of the Research School of Information Sciences and Engineering, Australian National University.
- ⇨ **Board of Studies** (Jun 2005 – Dec 2006), appointed to the College of Engineering and Computer Science Board of Studies, Australian National University.
- ⇨ **Graduate Degrees Committee** (Mar 2003), represented the Research School of Information Sciences and Engineering on the Graduate Degrees Committee, Australian National University.
- ⇨ **NICTA Student Endorsement Panel** (Nov 2002 – Oct 2003), member on this panel which sets academic standards for NICTA endorsed students and allocates scholarships.

Service:

- ⇨ **Mitigating Circumstances Committee** (Jan 2012 to date), responsible for considering exam mitigating requests by UG and PG students and report on upheld cases to exam board.
- ⇨ **Health and Safety Officer** (Dec 2009 to date), responsible for lab safety procedures, risk assessments and all health and safety requirements.
- ⇨ **Chair of Academic Loading Evaluation (ALE) committee** (Jan 2009 to Mar 2012), responsible for developing metrics for measuring academic load and strategies for managing academic load.
- ⇨ **2nd year/3rd year Exam Papers Review Panel** (Mar 2009 – Dec 2011), on a committee of academics that reviews 2nd year/3rd year exam papers and assesses their suitability before being released.
- ⇨ **M.Sc./M.Eng. Laboratory Director** (Sep 2007 – Jan 2010), responsible for all laboratory processes (inc. demonstrations, marking, up-keeping of equipment) for the M.Sc. degree in Control Systems.
- ⇨ **Postgraduate Student Conference Organising Committee** (Apr 2009 – Nov 2009), on an organising committee for a conference organised within EEE to exhibit the work of our PG students.
- ⇨ **M.Sc. Restructuring Committee** (Nov 2007 – Dec 2008), on work group responsible for restructuring the University of Manchester M.Sc. degree in “Advanced Control and Systems Engineering”.
- ⇨ **With Industrial Experience Committee** (Sep 2008 – Nov 2009), represent the Control Group on this committee of the School of Electrical and Electronic Engineering, University of Manchester.

- ⇨ **Industrial Visits for student outplacements** (Jul 2007 – Nov 2009), for control systems related industries on behalf of the School of Electrical & Electronic Engineering, University of Manchester.
- ⇨ **Publications Chair for UKACC Control 2008** (May 2007 – Sep 2008), managing processes related to the publication of papers for this national conference organised by the University of Manchester.
- ⇨ **Academic Promotions Committee** (in 2005), considered applications for promotion to various levels by academics in the ANU Information Sciences and Engineering Institute.
- ⇨ **Selection and Liaison Committees** (15 times member since Dec 2002), appointed twelve 3-year/5-year postdoctoral research fellows, one tenured senior research scientist and two tenured professors.

D. KNOWLEDGE AND TECHNOLOGY TRANSFER

Patents:

- ⇨ Inventors: Lanzon, A., Crowther, W., Pilmoor, M. and Geoghegan, P., “A Rotary Wing Vehicle”, *UK Intellectual Property Office and International Patent*, Patent granted (Serial No. GB2462452), Priority date: 08 August 2008.

Engagement with Business Community:

- ⇨ An £8.8M UAV project called GAMMA is funded to the level of £4.4M by the North West Aerospace Alliance Ltd., BAe Systems, National Nuclear Laboratories Ltd. and the University consortium partners and the remaining £4.4M are awarded by the UK government Regional Growth Fund.
- ⇨ The patented HexRotor project designed and built for the Ministry of Defence UAV Grand Challenge was developed in cooperation with BAe Systems, MBDA UK and AVi Ltd., Didsbury.
- ⇨ Car engine emissions control work was done in cooperation with AVL Powertrain UK Ltd., Essex.
- ⇨ The EPSRC project “Advances in robust control methods and application to flying discs” has significant interactions with Honeywell Advanced Technology Labs and MathWorks Ltd.
- ⇨ Consultancy on medium-sized (20Kg) Unmanned Aerial Vehicles helicopter control for Barnard MicroSystems Ltd.

Engagement with Media:

- ⇨ An article on my UAV flying discs EPSRC project appeared in the *Flight International Magazine*, p. 30, Apr/May 2010.
- ⇨ Centre-page article and full page-sized photo describing one of my research projects (see the patent above) appeared on the *Times Higher Education Supplement Magazine* of Aug 2008.
- ⇨ TV interview (approx. 30 minute final edited air-time) given to an EU Educational TV Channel in Feb 2008 to prepare a program for secondary school children to attract them to science and engineering. TV appearance in late 2008.

Organisation of Community Workshops:

- ⇨ Postgraduate workshop on “Systems, Signals and Control”. Three international plenary speakers and 25 PhD student presentations were invited across the country as a PhD student national networking event. Venue: *Australian National University*, Australia, Feb 2006.
- ⇨ Postgraduate workshop on “Nonlinear control methods: When and how to use them?” Plenary speakers: Prof P Kokotovic, Prof M Krstic, Prof I Mareels. Venue: *Australian National University*, Australia, Nov 2004.