

**CHARLES PARSONS INITIATIVE ON ENERGY & SUSTAINABLE ENVIRONMENT  
UNIVERSITY OF LIMERICK**

**Selected Publications Listed Under The Following Headings: Refereed Journals, Books & Chapters In Books, Refereed Conference papers, Keynote & Invited Lectures, Patents, Other**

PUBLICATIONS 2007.....	3
Refereed Journals ‘07 .....	3
Books & Chapters In Books ‘07 .....	4
Refereed Conference papers ‘07.....	4
Keynote & Invited Lectures ‘07 .....	5
Patents ‘07.....	5
Other ‘07.....	5
PUBLICATIONS 2006.....	6
Refereed Journals ‘06 .....	6
Books & Chapters In Books ‘06 .....	6
Refereed Conference papers ‘06.....	7
Keynote & Invited Lectures ‘06 .....	10
Patents ‘06.....	10
Other ‘06.....	10
PUBLICATIONS 2005.....	11
Refereed Journals ‘05 .....	11
Books & Chapters In Books ‘05 .....	12
Refereed Conference papers ‘05.....	12
Keynote & Invited Lectures ‘05 .....	15
Patents ‘05.....	15
Other ‘05 .....	15
PUBLICATIONS 2004.....	17
Refereed Journals ‘04 .....	17
Books & Chapters In Books ‘04 .....	18
Refereed Conference papers ‘04.....	18
Keynote & Invited Lectures ‘04 .....	21
Patents ‘04.....	21
Other ‘04.....	21
PUBLICATIONS 2003.....	23
Refereed Journals ‘03 .....	23
Books & Chapters In Books ‘03 .....	24
Refereed Conference papers ‘03.....	25
Keynote & Invited Lectures ‘03 .....	27
Patents ‘03.....	27
Other ‘03 .....	27
PUBLICATIONS 2002.....	28
Refereed Journals ‘02 .....	28
Books & Chapters In Books ‘02 .....	28
Refereed Conference papers ‘02.....	29

Keynote & Invited Lectures '02 .....	29
Patents '02.....	29
Other '02 .....	29
PUBLICATIONS 2001.....	30
Refereed Journals '01 .....	30
Books & Chapters In Books '01 .....	30
Refereed Conference papers '01 .....	31
Keynote & Invited Lectures '01 .....	31
Patents '01.....	31
Other '01 .....	31
PUBLICATIONS 2000.....	32
Refereed Journals '00 .....	32
Books & Chapters In Books '00 .....	32
Refereed Conference papers '00.....	32
Keynote & Invited Lectures '00 .....	32
Patents '00.....	33
Other '00 .....	33

## PUBLICATIONS 2007

### *Refereed Journals '07*

C. Edward Clapp, Michael H.B. Hayes, Claudio Ciavatta. 2007. Organic wastes in soils: Biogeochemistry and environmental aspects. *Soil Biology & Biochemistry*. 39, 1239-1243.

G. Dooly, C. Fitzpatrick, P. Chambers and E. Lewis, "On-board monitoring of vehicle exhaust emissions using an ultra-violet optical fibre based sensor", *Journal of Optics A: Pure and Applied Optics Special Issue*, in press.

G. Dooly, E. Lewis, C. Fitzpatrick and P. Chambers, "Low Concentration Monitoring of Exhaust Gases Using a UV Based Optical Sensor", *IEEE Sensors Journal Special Issue*, in press.

Etelvino H. Novotny, Eduardo R. deAzevedo, Tito J. Bonagamba, Tony J. F. Cunha, Beáta E. Madari, Vinícius de M. Benites, Michael H.B. Hayes. 2007. Studies of the Compositions of Humic Acids from Amazonian Dark Earth Soils. *Environ. Sci. Technol.* 41, 400-405.

Julieta A. Ferreira, M. H. B. Hayes, Jingdong Mao, K. Schmidt-Rohr, Ana B. Pedrosa, Betânia F. Pereira, Débora M. B. P. Milori, L. Martin-Neto 2007. Characterization of humic fractions isolated from two soils of the same type subjected to different management systems. *Soil Biology and Biochemistry*. Submitted for publication.

Hawe, E., G. Dooly, C. Fitzpatrick, E. Lewis, W. Z. Zhao, T. Sun, K. T. V. Grattan, M. Degner, H. Ewald, S. Lochmann, G. Bramman, C. Wei, D Hitchen, A. Al-Shamma'a, E. Merlone-Borla, P. Faraldi and M. Pidria. "Measurement of exhaust gas emissions using absorption spectroscopy", *International journal of systems technologies and applications*, Accepted June 2006, in press.

E Hawe, P Chambers, C Fitzpatrick and E Lewis, "CO<sub>2</sub> monitoring and detection using an integrating sphere as a multipass absorption cell" *Measurement Science and Technology*, Special issue, in press  
E. Hawe, C. Fitzpatrick, P. Chambers and E. Lewis, "An investigation into the use of an integrating sphere as a gas absorption cell", *Journal of Optics A: Pure and Applied Optics Special Issue*, in press

M.H.B. Hayes. 2006. Biochar and biofuels for a brighter future. **Nature** 443, Letters to the Editor, p.144

T. M. Hayes, M. H. B. Hayes, J. O. Skjemstad, R.S. Swift. 2007. Studies of compositional relationships between organic matter in a grassland soils and its drainage waters. *European Journal of Soil Science*. Submitted for publication.

E. Lewis, C. Sheridan, M. O'Farrell, C. Flanagan, J.F. Kerry, N. Jackman "Optical fibre sensors for assessing food quality in full scale production ovens-a principle component analysis and artificial neural network based approach" *Journal of Nonlinear Analysis: Hybrid Systems*, in press

E. Lewis, C. Sheridan, M. O'Farrell, D. King, C. Flanagan, WB Lyons and C. Fitzpatrick "Principal Component Analysis and Artificial Neural Network Based Approach to Analysing Optical Fibre Sensors Signals", Invited Review Article, 25 year Anniversary edition of *Sensors & Actuators: A. Physical*, in press

Molnar L., Omerdic E. and Toal D., Guidance, Navigation and Control System for the Tethra Unmanned Underwater Vehicle, 27 pages, In Print in Special Issue of *International Journal of Control*, Submission date: April 30, 2006. Taylor & Francis production department production tracking number: TCON 224416

Mulrooney J., Clifford J., Fitzpatrick C., Lewis E. "Detection of Carbon Dioxide Emissions from a Diesel Engine using a Mid-Infrared Optical Fibre Based Sensor" *Sensors and Actuators A*, in press

## **Charles Parsons Initiative On Energy & Sustainable Environment**

### **Selected Publications**

Nasr, A., Bruen, M., Jordan, P., Moles, R., Kiely, G., Byrne, P. 2007 'A comparison of SWAT, PSF and SHETRAN/GOPC for modelling phosphorus export from three catchments in Ireland'. *Water Research* 41, 1065-1073.

O'Keeffe S., Fitzpatrick C., Lewis E., "An optical fibre based ultra violet and visible absorption spectroscopy system for ozone concentration monitoring", *Sensors & Actuators: B. Chemical*, in press

C. Sheridan, M. O'Farrell, E. Lewis, C. Flanagan, J. Kerry and N. Jackman, "A comparison of CIE L\*a\*b\* and spectral methods for the analysis of fading in sliced cured ham", *Journal of Optics A: Pure and Applied Optics Special Issue*, in press.

Andre. J. Simpson, Guixue Song, Emma Smith, Buuan Lam, Etelvino. H. Novotny and Michael H.B Hayes. 2007. Unraveling the structural components of soil humin using solution state nuclear magnetic resonance spectroscopy. *Environ. Sci. and Technol.* 41, 876-883.

G. Song, E.H. Novotny, A.J. Simpson, C.E. Clapp, M.H.B. Hayes 2007. Sequential exhaustive extractions, and characterisations using solid and solution state NMR, of the humic, including humin, components in a Mollisol soil. *European Journal of Soil Science*. Submitted for publication.

Van de Ven PWJ, Johansen TA, Sørensen AJ, Flanagan C, Toal D, Neural network augmented identification of underwater vehicle models, *J Control Engineering Practice*, Elsevier, Vol 15/6 2007, pp 715-725, DOI information: 10.1016/j.conengprac.2005.11.004

### ***Books & Chapters In Books '07***

#### ***Refereed Conference papers '07***

Boyle D., Newe T., 2007. "The Magnitude of Communications Protocols in Wireless Sensor Networks". *WLANMESH – Towards an 802.11 standard for Mesh Networking*. 17th – 20th April 2007, Paris, France.

Boyle D., Newe T., 2007. "A Survey of Authentication Mechanisms: Authentication for Ad-Hoc Wireless Sensor Networks". *IEEE Sensors Applications Symposium (SAS 2007)*. 6th - 8th Feb 2007, San Diego, CA USA. ISBN: 1-4244-0678-1.

Boyle D., Newe T., 2007. "Security Protocols for use with Ad-Hoc Wireless Sensor Networks: A Survey of Security Mechanisms". *IEEE Third International Conference on Wireless and Mobile Communications - ICWMC 2007*. 4th – 9th March 2007, Guadeloupe, French Caribbean, ISBN 0-7695-2796-5.

J.P.Dakin, P.Chambers, "Review of methods of optical gas detection by direct optical spectroscopy with emphasis on correlation spectroscopy" *ASCOS 2006 Tihany*, Hungary 3-9 Sep 2006

Healy M., Newe T., Lewis E., 2007. "Power Management in Operating Systems for Wireless Sensor Nodes". *IEEE Sensors Applications Symposium (SAS 2007)*. 6th - 8th Feb 2007, San Diego, CA USA. ISBN: 1-4244-0678-1.

## **Charles Parsons Initiative On Energy & Sustainable Environment**

### **Selected Publications**

Nilsson G.E., C. Anderson C., Henricson J., Leahy M., O'Doherty J., Sjoberg F., "Tissue Viability Imaging in Dermatology", Proc 21st World Congress of Dermatology, Buenos Aires, Argentina, 2007 (Accepted for publication).

Omerdic E & Toal D., Modelling of waves and ocean currents for real-time simulation of ocean dynamics, Accepted for and to be presented at IEEE Oceans 2007, 18-21 June 2007, Aberdeen.

Thurman E., Riordan J and Toal D., Automated optimisation of simultaneous multibeam and sidescan sonar seabed mapping Accepted for and to be presented at IEEE Oceans 2007, 18-21 June 2007, Aberdeen.

Toal D, Challenges of ROV system integration for deep water habitat mapping, MESH (Mapping European Seabed Habitats) Subtidal Workshop, 30 Jan 2007, Galway.

### ***Keynote & Invited Lectures '07***

### ***Patents '07***

### ***Other '07***

## Charles Parsons Initiative On Energy & Sustainable Environment

### Selected Publications

## PUBLICATIONS 2006

### *Refereed Journals '06*

C.E. Clapp and M.H.B. Hayes. 2006. Milestones in soil organic matter studies. *Soil Sci.* 171, S112-S115.

Doody D., Moles, R., Tunney, H., Kurz, I., Bourke, D., and O'Regan, B. 2005 'Impact of flow path length and flow rate on phosphorus loss in simulated overland flow from a humic gleysol grassland soil.' *Science of the Total Environment*, 372(1), 247-255.

Donlan, J., O'Regan, B., Morrissey, J., Foley, W., Leonard, J., Moles, R. 2006 'Spatial modelling of sustainability indicators across three regions of Ireland.' *Environmental Science and Technology*, 2, 409-413.

Dong H., W. Zhao, T. Sun, K.T.V. Grattan, A.I. Al-Shamma'a, C. Wei, J. Mulrooney, J. Clifford, C. Fitzpatrick, E. Lewis, M. Degner, H. Ewald, S.I. Lochmann, G. Bramann, E. Merlone Borla, P. Faraldi, M. Pidria, "Vibration Insensitive Temperature Sensing System Based on Fluorescence Decay and Using a Digital Processing Approach", *Measurement Science Technology*, 17(7), 2006, 2010 - 2014.

Etelvino H Novotny, Michael HB Hayes, Eduardo R deAzevedo, and Tito J Bonagamba . 2006. Characterisation of Black Carbon rich samples by <sup>13</sup>C solid-state nuclear magnetic resonance. *Naturwissenschaften* 93, 447-450.

M.H.B. Hayes. 2006. Solvent systems for the isolation of organic components from soils. *Soil Sci. Soc. Am. J.* 70, 986-994

O'Doherty, J, G.E. Nilsson, J. Henricson, F. Sjöberg and M.J. Leahy. "Sub-epidermal imaging by polarised light rejection for assessment of microvascular patency." (In Press) *Journal of Biomedical Optics* 2006

O'Regan, B. and Moles, R. 2006 'Using system dynamics to model the interaction between environmental and economic factors in the mining industry.' *Journal of Cleaner Production* 14, 689-707. May.

Sheridan, C., M. O'Farrell, W. B. Lyons, E. Lewis, C. Flanagan and N. Jackman. "Monitoring food quality using an optical fibre based sensor system - a comparison of Kohonen and backpropagation neural network classification techniques", *Measurement Science and Technology*, 17 (2), pp229-234, February 2006.

Walsh, C., McLoone, A., O'Regan, B., Moles, R., Curry, R., 2006 'A comparison of the Ecological Footprint of two Irish urban areas: Limerick and Belfast.' *Irish Geography*, 36(1), 1-21.

### *Books & Chapters In Books '06*

Daniel J. Hayes, Michael H.B. Hayes, and Margaret M. Daly. 2006. Operação inovadora de biorrefino para produção de oleos combustiveis e de quimico-plataforma a partir de carboidratos de biomassa e de residuos diversos. In F.H. Dubbern de Souza, E.B. Pott, O. Primavesi, A.C. de Campos Bernardi, and A. de Andrade Rodrigues (eds) *Usos alternativos da palhada residual da produção de sementes para pastagens*. EMBRAPA, Sao Carlos, SP, 161-191.p.

Moles, R., Foley, W., and O'Regan, B. 2006 'The environmental impacts of private car transport on the sustainability of Irish settlements'. In Davenport, J. and Davenport, J. (Eds.) *The Ecology of*

## Charles Parsons Initiative On Energy & Sustainable Environment

### Selected Publications

Transportation: Managing Mobility for the Environment. Springer, Dordrecht, The Netherlands, pp119-164.

### **Refereed Conference papers '06**

Corinna M. Byrne, Etelvino H. Novotny, Tito J. Bonagamba, Deirdre Fay, Michael H.B. Hayes. 2006. The nature of sequestered carbon in an Irish grassland soil Proc. 13th Meeting, International Humic Substances Society (Karlsruhe), pp. 153-156.

Dong Chen, C. Edward Clapp, Jean-Alex E. Molina, Antonio J. Palazzo, Michael H.B. Hayes, Yi Zhang. 2006. Contributions of Corn Root Activities and Rhizosphere Soils to Total Carbon Dioxide Production. 18th World Congress of Soil Science (Philadelphia), 935b.

Clifford J., J. Mulrooney, C. Fitzpatrick., P. Chambers, E. Lewis, "Measurement of Hydrocarbon Exhaust Emissions Using an Optical Fibre Based Mid - Infrared Sensor", (IOP) Proc Photon 06, University of Manchester, U.K., 2006, 39.

Dooly G., E. Lewis, C. Fitzpatrick, P. Chambers, "Optical Sensing of Hazardous Exhaust Emissions Using a UV Based Extrinsic Sensor", (DCU) Proc International Conference on Vehicle Alternative Fuel Systems and Environmental Protection 2006 ( VAFSEP 06), Dublin City University, Dublin, Ireland, 154-159.

Dooly G., E. Lewis, C. Fitzpatrick, "Onboard Monitoring of Vehicle Exhaust Using an Ultra Violet Optical Fibre Based Sensor", (IOP) Proc Photon 06, University of Manchester, U.K., 2006, 14.

Dooly G., E. Lewis, C. Fitzpatrick, P. Chambers, "Onboard Monitoring of Vehicle Exhaust Using an UV Optical Fibre Based Sensor", (CUT) Proc Eurosensors 2006, Chalmers University of Technology, Gothenburg, Sweden, 2006.

Dooly G., E. Lewis, C. Fitzpatrick, "Onboard Monitoring of Hazardous Exhaust Emissions in Passenger Cars", (SPIE) Proc Optics East 2006, Boston, U.S.A, 6379 2006 Paper M7.

Etelvino H. Novotny, Michael H. Hayes, Eduardo R. De Azevedo, Beata E. Madari, Tony J. F. Cunha, and Tito J. Bonagamba. 2006. Compositions of the humic acids in Amazonian Anthropogenic Dark Earth soils. 18th World Congress of Soil Science (Philadelphia),

Etelvino H. Novotny, Michael H.B. Hayes, Eduardo R. de Azevedo, Vinícius de M. Benites, Beáta E. Madari, Tony J. F. Cunha, Tito J. Bonagamba. 2006. Studies of the compositions of humic acids from Amazonian Dark Earth soils. Proc. 13th Meeting, International Humic Substances Society (Karlsruhe), pp. 541-544.

Hawe, E., E. Lewis and C. Fitzpatrick, "An Optical Fibre Sensor for Multiple Gas Detection using an Integrating Sphere", (DCU) Proc International Conference on Vehicle Alternative Fuel Systems and Environmental Protection 2006 (VAFSEP 06), Dublin City University, Dublin, Ireland, 173 - 178.

Michael H.B. Hayes, André J. Simpson, C. Edward Clapp, and James Burdon. 2006. Compositions, aspects of structures, and clay associations of soil humic components. 18th World Congress of Soil Science (Philadelphia), 138-7.

Hawe, E., E. Lewis, P. Chambers and C. Fitzpatrick. "An Investigation into the feasibility of adapting an integrating sphere for use as a gas absorption cell". (IOP) Proc Photon 06, University of Manchester, U.K., 2006, 16.

Hawe, E., G. Dooly, E. Lewis and C. Fitzpatrick. "UV-based Pollutant Quantification in Automotive Exhausts", (SPIE) Proc Photonics Europe 2006, Strasbourg, France, 6198, 2006 Paper 07.

## Charles Parsons Initiative On Energy & Sustainable Environment

### Selected Publications

- Hawe, E., P. Chambers, C. Fitzpatrick and E. Lewis. "Gas detection using an integrating sphere as a multipass absorption cell" (SPIE) Proc Optics East 2006, Boston, U.S.A, 6379 2006 Paper OI.
- Hawe, E., P. Chambers, C. Fitzpatrick and E. Lewis. "A Theoretical and Experimental Investigation of the Effective Gas Absorption Path Length Exhibited By an Integrating Sphere Containing CO<sub>2</sub>", (OSA) Proc 18th international conference on Optical Fibre Sensors (OFS-18), Cancun, Mexico, 2006.
- Healy M., Newe T., Lewis E., 2006. "A Survey of Operating Systems for Wireless Sensor Nodes" The 5th Workshop on the Internet, Telecommunications and Signal Processing. 11th-13th December 2006, Hobart, Australia. ISBN 0975693425.
- Gleeson K., E. Lewis, "Fibre Optic Hydrogen Gas Detection Based on Palladium Thin Films", (IOP) Proc Photon 06, University of Manchester, U.K., 2006, 70-71.
- King, D., W.B. Lyons, C. Flanagan and E. Lewis. "A Five – Sensor Multipoint Optical Fibre Ethanol Concentration Sensor System Based on Artificial Neural Network Pattern Recognition", (IOP) Proc Photon 06, University of Manchester, U.K., 2006. 69-70.
- Li Y., Newe T., 2006. "Wireless Sensor Networks - Selection of Routing Protocols for Applications". The Australian Telecommunication Networks and Applications Conference for 2006 (ATNAC). 4th-6th December 2006, Melbourne, Australia. pp. 334-338. ISBN/ISSN 0977586103.
- Li Y., Newe T., 2006. "Wireless Sensor Networks– Routing Protocol Selection For Applications". The 5th Workshop on the Internet, Telecommunications and Signal Processing. 11th-13th December 2006, Hobart, Australia. ISBN 0975693425.
- Raymond McInerney, Etelvino H. Novotry, Kevin Young, and Michael H.B. Hayes. 2006. Chemical compositions of organic matter in China Ball Clay and lignite from a ball clay deposit from South West England. Proc. 13th Meeting, International Humic Substances Society (Karlsruhe), pp. 681-684.
- Mulrooney J., J. Clifford, C. Fitzpatrick, Lewis E., "Monitoring of Harmful Gaseous Emissions From Land Transport Vehicles Using A Mid Infrared Optical Fibre Sensor", (SPIE) Proc Photonics Europe 2006, Strasbourg, France, 6198, 2006.
- Mulrooney J., J. Clifford, C. Fitzpatrick, P. Chambers, Lewis E., "Monitoring of Carbon Dioxide Exhaust Emissions Using Mid Infrared Spectroscopy", (IOP) Proc Photon 06, University of Manchester, U.K., 2006. 38-39.
- Mulrooney J., J. Clifford, C. Fitzpatrick, P. Chambers, Lewis E., "Detection of Carbon Dioxide Emissions from a Land Transport Vehicle Using a Mid Infrared Optical Fibre Sensor", (DCU) Proc International Conference on Vehicle Alternative Fuel Systems and Environmental Protection 2006 ( VAFSEP 06), Dublin City University, Dublin, Ireland.
- Mulrooney J., J. Clifford, C. Fitzpatrick, P. Chambers, Lewis E., "Detection of Carbon Dioxide Emissions from a Land Transport Vehicle Using a Mid Infrared Optical Fibre Sensor", Proc Optics East 2006, Boston, U.S.A, 6379 2006.
- Mulrooney J., J. Clifford, C. Fitzpatrick, P. Chambers, Lewis E., "Mid Infrared Optical Fibre Based Detection of Carbon Dioxide from a Diesel Engine", (OSA) Proc 18th international conference on Optical Fibre Sensors (OFS-18), Cancun, Mexico, 2006.
- O'Connell E., W. Lyons, E. Lewis, "Fibre Optic Detection of Harmful Algal Blooms in Seawater", (IOP) Proc Photon 06, University of Manchester, U.K., 2006. 13.



## Charles Parsons Initiative On Energy & Sustainable Environment

### Selected Publications

O'Doherty J., J. Henricson, G.E. Nilsson, F. Sjoberg, M.J. Leahy, "Investigation of Microvascular Red Blood Cell Proliferation in Dermal Tissue", (IOP) Proc Institute of Physics Ireland Annual Spring Meeting, Newbridge, Kildare, Ireland, 2006.

Marion O'Farrell, Cormac Sheridan, Elfed Lewis, Colin Flanagan "Building a classifier for the prediction of the colour fading rate of cured ham", 6th International Conference on Recent Advances in Soft Computing, Canterbury, United Kingdom, 10-12th July 2006.

O'Keefe S., A. Fernandez Fernandez, C. Fitzpatrick, B. Birchard, E. Lewis, "PMMA Optical Fibres for Real-Time Gamma Dosimetry", (OSA) Proc 18th international conference on Optical Fibre Sensors (OFS-18), Cancun, Mexico, 2006.

Dan C. Olk, Ed G. Gregorich, Annemieke Farenhorst, Mike H.B. Hayes, Eldor A. Paul, Myrna J. Simpson. 2006. Biological, chemical, and physical fractionations for soil organic matter. Proc. 13th Meeting, International Humic Substances Society (Karlsruhe), pp. 21-24.

Sheridan C., M. O'Farrell, E. Lewis, C. Flanagan, J. Kerry, N. Jackman, "A Comparison of CIE L\*a\*b and Spectral Methods for the Analysis of Sliced Ham Fading", (IOP) Proc Photon 06, University of Manchester, U.K., 2006. 9-10.

Sheridan, C., M. O'Farrell, E. Lewis, C. Flanagan, J. F. Kerry and N. Jackman, "Measurement and prediction of ham colour fading", Proc. EuroSensors XX 2006, Chalmers University of Technology, Gothenburg, Sweden, September 2006

Sheridan, C., M. O'Farrell, E. Lewis, C. Flanagan, J. F. Kerry and N. Jackman, "Choosing a suitable method for classifying the progressive colour fading of cured ham", Proc. ISSC 2006, pp. 477-482, June 2006

Sheridan C., M. O'Farrell, E. Lewis, C. Flanagan, J. F. Kerry and N. Jackman, "An examination of ham color fading using optical fiber methods", Proc. Optics East, Boston, Oct. 2006

Guixue Song, Etelvino Novotony, Eduardo Azevedo, Tito Bonagamba, Julieta Ferreira, Corinna Byrne, Patrick Cross, C. Edward Clapp, and Michael H.B. Hayes. 2006 Isolation of humin from The most recalcitrant of The SOM components using aqueous urea and acidified dimethylsulfoxide. Proc. 13th Meeting, International Humic Substances Society (Karlsruhe), pp. 197-200.

Sousa R.V. de, Inamasu R.Y., Port, A.J.V., Toal D., Flanagan C., Composition and coordination of reactive fuzzy behaviors for autonomous navigation of a mini-robot platform. In: P. E. Myiagi; E. Villani; Horikawa. (Org.). ABCM Symposium Series in Mechatronics. - ed. Rio De Janeiro: ABCM (In the Prelo), 2006, v. 2

Horgan J., Toal D., Review of Machine Vision Applications in Unmanned Underwater Vehicles, IEEE 9th International Conference on Control Automation Robotics and Vision (ICARCV 06), Singapore, December 2006.

Omerdic E., Riordan J., Molnar L., Toal D., Virtual Underwater Lab: Efficient Tool for System Integration & UUV Control Development, 7th IFAC MCMC, Lisbon, Portugal, September 2006.  
Horgan J., Toal D., Vision systems in the control of Autonomous Underwater Vehicles, 7th IFAC MCMC, Lisbon, Portugal, September 2006.

Riordan J., Omerdic E., Molnar L., Toal D., Real-Time Sonar Simulator Integrated with Vehicle Control and Navigation for Ocean-Floor Mapping Applications in Survey-Scale Environments, 7th IFAC MCMC, Lisbon, Portugal, September 2006.

Nolan S., Toal D., An Ultrasonic Sensor for Close Range Collision Avoidance on AUVs, 7th IFAC MCMC, Lisbon, Portugal, September 2006.

## **Charles Parsons Initiative On Energy & Sustainable Environment**

### **Selected Publications**

Horgan J., MacGiollEáin C., Toal D., Working towards VAUV, Vision Controlled Autonomous Underwater Vehicles, Mechatronics 2006, The 10th Mechatronics Forum Biennial International Conference, Penn State Great Valley, Malvern, USA, June 2006.

Toal D., Omerdic E., Nolan S., Al-Shamma'a A., Intervention AUVs for permanent seabed observatories, addressing some of the key technical challenges, In proceedings of , SSC '06, IEEE Fourth International Workshop on Scientific Use of Submarine Cables and Related Technologies 2006, 7 - 10 Feb, Dublin.

Shaw A., Al-Shamma'a A., Wylie S. R., Toal D., Present investigations of electromagnetic waves propagations in water and sea water, In proceedings of , SSC '06, IEEE Fourth International Workshop on Scientific Use of Submarine Cables and Related Technologies 2006, 7 - 10 Feb, Dublin.

### ***Keynote & Invited Lectures '06***

### ***Patents '06***

.

### ***Other '06***

Grehan A, Toal D and Brown C. ROV Investigations of Cold Water Coral Habitats in the Porcupine/Rockall off the west coast of Ireland. The Irish Scientist, 2006 Yearbook, No 14, November 2006, pp 96

Hall, T., O'Regan, B., Moles, R. 2006 Environmental Management Guidelines. Environmental Management in the Extractive Industry (Non-Scheduled Minerals). Environmental Protection Agency, Johnstown Castle, Co Wexford. May.

## Charles Parsons Initiative On Energy & Sustainable Environment

### Selected Publications

## PUBLICATIONS 2005

### *Refereed Journals '05*

Browne, D, O'Regan, B. and Moles, R. 'A comparative analysis of the application of sustainability metric tools using Tipperary town, Ireland, as a case study.' *Management of Environmental Quality* 16(1), 37-54.

Fitzpatrick, C., J. Walsh, P. Quinn, I. Grout and E. Lewis "Reproducible Coating & Testing Techniques for Large Core Luminescent Clad Optical Fibre Probes For UV Detection" *Sensors & Actuators A*, Vol 118/1, 2005, pp 57-62.

Jordan, P., Menary, W., Daly, K., Kiely, G., Morgan, G., Byrne, P. and Moles, R. 2005 'Patterns and processes of phosphorus transfer from grassland soils to rivers – integration of laboratory and catchment studies.' *Journal of Hydrology* 304, 20-34.

McSherry, M., C. Fitzpatrick, E. Lewis, 'Review of luminescent based fibre optic temperature sensors', *Sensor Review*, Vol. 25, No. 1, pp 56-62, ISSN 0260-2288

McSherry, M., C. Fitzpatrick, E. Lewis, "Development of Temperature Sensitive Glassware for Monitoring Temperature in Harsh Industrial Environments", *Sensors & Actuators A*, Vol. 123-124, Sept 2005, pp 408-417.

McSherry, M., C. Fitzpatrick, E. Lewis, S. Wylie, C. Wright, A. Al-Shamma'a, J. Lucas 'Development of an Extrinsic Optical Fibre Temperature Sensor for Monitoring Liquid Temperature in Harsh Industrial Environments', *Journal of Optics A: Pure & Applied Optics*, Vol. 7, No. 6, June 2005, pp S331-S339.

Moles, R., Breen, J. and O'Regan, B. 'A pilot scale long term experimental study on the effects of grazing and gap creation on Burren grassland dynamics: implications for conservation. *Biology and Environment: Proceedings of the Royal Irish Academy* 105B(1), 15-32.

O'Farrell, M., E. Lewis, C. Flanagan, W.B. Lyons, N. Jackman, "Design of a System that uses Optical Fibre Sensors and Neural Networks to Control a Large-Scale Industrial Oven by Monitoring the Food Quality Online" *IEEE Sensors Journal*, 5(6), pp 1407- 1420, Dec 2005

O'Farrell, M., E. Lewis, C. Flanagan, W.B. Lyons and N. Jackman "Combining principal component analysis with an artificial neural network to perform online quality assessment of food as it cooks in a large-scale industrial oven" *Sensors and Actuators B: Chemical* , 107(1) , pp 104-112, (2005)5.

O'Farrell, M., E. Lewis, C. Flanagan, N. Jackman "Comparison of K-NN and Neural Network methods in the classification of Spectral Data from an Optical Fibre-Based Sensor System used for Quality Control in the Food Industry" *Sensors and Actuators B: Chemical*, Vol 111-112C pp 354-362, 2005

O'Keefe S., Fitzpatrick C., Lewis E., "Ozone measurement in the visible region: an optical fibre sensor system". *Electronic Letters*, Volume 41, Issue 24, pp 1317-1319.

Pithon, J. A., Moles, R. and O'Halloran, J. 2005 'The influence of coniferous afforestation on lowland farmland bird communities in Ireland: different seasons and landscape contexts'. *Landscape and Urban Planning* 71, 91-103.

## **Charles Parsons Initiative On Energy & Sustainable Environment**

### **Selected Publications**

Riordan J., Toal D., Towards Real-Time Simulation of the Sidescan Sonar Imaging Process. In: WSEAS Transactions on Computers, Vol.4, Iss.2, February 2005. Pages 247-252. ISSN 1109-2750.

Toal DJF, Flanagan C, Lyons WB, Nolan S and Lewis E, Proximal object and hazard detection for autonomous underwater vehicle with optical fibre sensors, Robotics and Autonomous Systems, Vol 53, Iss 3-4 , 2005, pp 214-229.

Van de Ven PWJ, Flanagan C, Toal D. Neural network control of underwater vehicles, in: Engineering Applications of Artificial Intelligence, Vol 18, 2005, pp.533 – 47

### **Books & Chapters In Books '05**

C.E. Clapp, M.H.B. Hayes, A.J. Simpson, and W.L. Kingery. 2005. The chemistry of soil organic matter. In A. Tabatabai and D.L. Sparks (eds), Chemical Processes in Soils. American Society of Agronomy, Madison, Wis. pp. 1-150.

Doody, D., Kurtz, I., Tunney, H. and Moles, R. 'Flow effects on phosphorus loss in overland flow'. In Dunne, E.J., Reddy, K. R. And Carton, O. T. (Eds.) Nutrient management in agricultural watersheds. A wetland solution. Wageningen Academic Publishers, The Netherlands.

Daniel J. Hayes, S.W. Fitzpatrick, M.H.B. Hayes, and J.R.H. Ross. 2005. The Biofine Process: Production of levulinic acid, furfural and formic acid from lignocellulosic feedstocks. In B. Kamm, V.R. Gruber, and M. Kamm (eds) Biorefineries, Volume 1, Principles and Fundamentals. Wiley-VCH. pp. 139-164.

Moles, R. and O'Regan, B. 'Sub-Global assessments: Scenarios' Ed. Chapter 10 in Biodiversity and human well-being: a synthesis report for the Convention on Biological Diversity. UNEP. Island Press, London

Moles, R. 'Sub-Global assessments: Responses' Ed. Chapter 9 in Biodiversity and human well-being: a synthesis report for the Convention on Biological Diversity. UNEP. Island Press, London.

O'Regan, B., Moles, R. 2005 'System Dynamics Modelling - a more effective tool for assessing the impact of environmental and planning processes on the mining industry'. In Petterson, M.G., Marker, B. McEvoy F., and Stephenson, M. (Eds.), Sustainable mineral development in the developing world. Special Publication of the Geological Society of London.

J. Skjemstad, R. Swift, and M. Hayes. 2005. Evaluation of changes in NMR during ASR at the Bolivar site. In P. Dillon and S. Toze (eds), Water Quality Improvements During Aquifer Storage and Recovery. Vol. 1: Water Quality Improvements Processes. Awwa Research Foundation, Denver, Colo. pp. 99-110.

### **Refereed Conference papers '05**

Al-Shamma'a, A., Fitzpatrick C., Lucas J., Pandithas I., Lewis E., "Low Pressure Gas Discharges for Electric Field Intensity Monitoring in Microwave Resonant Cavities", Opto Ireland, 4th-5th April 2005, Dublin, pp460-465.

Dong, H., Zhao W., Sun T., Grattan K.T.V., Al-Shamma'a A., Wei C., Mulrooney J., Clifford J., Fitzpatrick C., Lewis E., Degner M., Ewald H., Lochmann S., Bramann G., Merlone Borla E., Faraldi P., Pidria M., "Vibration-insensitive Temperature Sensing System Based on Fluorescence Decay and Using a Digital Processing Approach", Sensors & their Applications XIII, Kent, UK, 6th-8th September 2005, pp 315-322.

## Charles Parsons Initiative On Energy & Sustainable Environment

### Selected Publications

Dooly, G., Hawe E., Fitzpatrick C., Lewis E. et al "Optical Fibre Sensors for Vehicle Exhaust Gas Detection in the Ultra Violet Wavelength Range". In Proceedings of the 1st International Conference on Sensing Technology. Palmerston North, New Zealand, 21st-23rd Nov 2005. pp 42-47

Fernandez Fernandez, A., S. O'Keeffe, C. Fitzpatrick, B. Brichard, F. Berghmans, E. Lewis, "Gamma Dosimetry Using Commercial PMMA Optical Fibres for Nuclear Environments", Proceeding of 17th International Conference on Optical Fibre Sensors, Bruges, Belgium, 23rd-27th May 2005, pp 499-502

Griffin, G., Fitzpatrick C., Ryan R., Lewis E., "Prototyping a Multi-Point Luminescent Decay Based Temperature Sensor using Polymer Optical Fibres", 14th International Conference on Polymer Optical Fibres POF 2005, Hong Kong, 19th-22nd September 2005, pp299-302

Michael H.B. Hayes. 2005. Considerations of compositions and structures of humic substances. (eds E.H. Novotny, V. de Melo Benites, D. Vilas Boas de Campos), Resumos Expandidos VI Encontro Brasileiro de Substancias (Rio de Humicas Rio de Janeiro), pp. 10-17.

Hawe, E., Lewis E., Fitzpatrick C., "Hazardous Gas Detection with an Integrating Sphere in the Near Infrared", Sensors & their Applications XIII, Kent, UK, 6th-8th September 2005, pp 250-255.

Hawe, E., E. Lewis and C. Fitzpatrick. "Hazardous Gas Detection in the Near Infrared", International Symposium on Automatic Control, 22nd - 23rd September 2005, Wismar.

King, D., Lyons W.B., Flanagan C., Lewis E., "Development of an Intelligent Optical Fibre Sensor System for in situ Measurement of External Species in Fluids Utilising Signal Processing Techniques and Artificial Neural Network Pattern Recognition", Optical Sensors in Physiological Measurements, Institute of Physics, London, England, 11th May 2005.

King, D., Lyons W.B., Flanagan C., Lewis E., "Toward A Multipoint Optical Fibre Sensor System For Use In Process Water Systems Based on Artificial Neural Network Pattern Recognition", Proc Journal of Physics: Conference Series, Sensors and Their Applications XII, 15, University of Greenwich at Medway, U.K., (2005) 237-243.

King, D., Lyons W.B., Flanagan C. and Lewis E. "Utilising Pattern Recognition Techniques to Implement a Multipoint Optical Fibre Sensor System for Use in Process Water Systems" In Proceedings of the 4th IEEE Sensors Conference, Irvine Ca, USA, Oct 31 - Nov 3, 2005 (Published on CD)

McSherry, M., C. Fitzpatrick, E. Lewis, "Temperature Sensitive Glassware for Monitoring Liquid or Surface Temperatures in a High Power Microwave Environment", Opto Ireland, 4th-5th April 2005, Dublin, pp654-662.

Mulrooney J., J. Clifford, C. Fitzpatrick, E. Lewis, "Detection of Exhaust Gas Emissions Using a Mid-Infrared Optical Fibre Based Sensor", Proc 4th International Symposium on Automatic Control, Wismar, Germany, 2005.

Mulrooney, J., Clifford J., Fitzpatrick C., "Measurement of Exhaust Emissions Using A Mid-Infrared Optical Fibre Based Sensor", Eurosensors, Barcelona, Spain, 11th-14th September 2005, MP7.

Mulrooney, J., Clifford J., Fitzpatrick C., "Online Monitoring of Exhaust Emissions Using Mid-Infrared Spectroscopy", Sensors & their Applications XIII, Kent, UK, 6th-8th September 2005, pp 33-35

Mulrooney, J., Clifford J., Fitzpatrick C., Lewis E., Zhao W.Z., Sun T., Grattan K.T.V, Degner M., Ewald H., Lochmann S., Al-Shamma'a A., Lucas J., Merlone Borla E., Faraldi P., "Optical Fibre Sensors for the Monitoring of Harmful Emissions from Land Transport Vehicles", Opto Ireland, 4th-5th April 2005, Dublin, pp586-597.

## Charles Parsons Initiative On Energy & Sustainable Environment

### Selected Publications

Mulrooney, J., J. Clifford, C. Fitzpatrick, E. Lewis, "Mid-infrared Optical Fibre Sensor Based Detection of Exhaust Gases", Proceeding of 17th International Conference on Optical Fibre Sensors, Bruges, Belgium, 23rd-27th May 2005, pp 455-458

Etelvino H. Novotny, Michael H.B. Hayes, Eduardo R. de Azevedo, Tito J. Bonagamba, Vinicius de M. Benites, Beata E. Madari, Tony J. Cunha. 2005. Caracterizacao do carbono pirogenico por ressonancia magnetica nuclear. (eds E.H. Novotny, V. de Melo Benites, D. Vilas Boas de Campos), Considerations of compositions and structures of humic substances. Resumos Expandidos VI Encontro Brasileiro de Substancias (Rio de Humicas Rio de Janeiro), pp. 28-31.

O'Keeffe, S., Fitzpatrick C., Fernandez Fernandez A., Brichard B., Berghmans F., Lewis E., "Evaluation of PMMA optical fibres as gamma dosimeters for nuclear applications", 13th International Plastic Optical Fibres Conference, Nurnberg, Germany, Sept. 2004, pp364-370

O'Keeffe, S., Fitzpatrick C., Lewis E., "Ozone measurement using optical fibre sensors in the visible region", IEEE Sensors 2005, Irvine, CA, Oct. 2005.

O'Keeffe, S., Fitzpatrick C., Lewis E., "Ozone Sensing in the Visible Region using PMMA Optical Fibres", 14th International Conference on Polymer Optical Fibres POF 2005, Hong Kong, 19th-22nd September 2005, pp303-306

O'Keeffe, S., Fitzpatrick C., Lewis E., "A visible based optical fibre sensor for monitoring high ozone concentrations", 4th International Symposium on Automatic Control, Wismar, Germany, Sept. 2005

O'Keeffe, S., Dooly G., Fitzpatrick C., Lewis E., "Optical Fibre Sensor for the Measurement of Ozone". Sensors & their Applications XIII, Kent, UK, 6th-8th September 2005, pp 213-218.

Sheridan, C., O'Farrell M., Lewis E., Flanagan C. and Jackman N. "Simplifying the Training Process of an ANN Food Colour Classifier" In Proceedings of the 1st International Conference on Sensing Technology. Palmerston North, New Zealand, 21st-23rd Nov 2005. pp 511-514

Sheridan, C., M. O'Farrell, W. B. Lyons, E. Lewis, C. Flanagan and N. Jackman, "A comparison of k-NN, backpropagation and Self-Organising Map classification methods using an optical fibre based sensor system utilised in an industrial large scale oven", Proc. Opto-Ireland 2005, page 91, 4-6th April 2005

Sheridan, C., M. O'Farrell, W. B. Lyons, E. Lewis, C. Flanagan and N. Jackman, "Blood detection in the spinal column of whole cooked chicken using an optical fibre based sensor system", Proc Sensors & their Applications XIII, Kent, UK, 6th-8th September 2005

Sheridan, C., M. O'Farrell, W. B. Lyons, E. Lewis, C. Flanagan and N. Jackman, "Improving the training of an ANN cooked food colour sensor by examining the link between their temperature and colour", Proc. Of the 4th International Symposium on Automatic Control, Wismar, Germany, 22nd-23rd September 2005

Sheridan, C., M. O'Farrell, W. B. Lyons, E. Lewis, C. Flanagan and N. Jackman, "Online pattern recognition, using ANN and SOM, to determine quality during the cooking process in the food industry", Proc. ISSC 2005, pp. 249-253, September 2005.

Sheridan, C., M. O'Farrell, W. B. Lyons, E. Lewis, C. Flanagan and N. Jackman, "Optical fibre based sensor system for the detection of blood in the spinal column of cooked whole chicken" Proc. Eurosensors XIX, I, pp. TP66, 11-14th September 2005

SOUSA, Rafael Vieira de ; INAMASU, Ricardo Yassushi ; PORTO, Arthur José Vieira ; TOAL, Daniel ; FLANAGAN, Colin . Composition and coordination of reactive fuzzy behaviors for autonomous navigation of a mini-robot platform. In: 18th International Congress of Mechanical Engineering, 2005, Ouro Preto - MG. 18th International Congress of Mechanical Engineering, 2005.

## **Charles Parsons Initiative On Energy & Sustainable Environment**

### **Selected Publications**

Grehan A, Wilson M, Guinan J, Riordan J, Molnar L, Omerdic E, Ullgren J, Le Guilloux E, Toal D & Brown C. ROV Investigations of Cold-Water Coral Habitats along the Porcupine Bank Margin, West Coast of Ireland. 3rd International Symposium on Deep-Sea Corals, Science and Management, University of Miami, Nov 28-Dec 2, 2005, Miami, USA.

Van de Ven PW.J, Hayes MJ, Flanagan C, and Toal D, On the identification and control of underwater vehicle dynamics: a neural network approach. Presented at Complexity Workshop, 16 Sept., '05 Maynooth Ireland.

Omerdic E., Toal D., Control allocation of over-actuated thruster propelled underwater vehicles, In proceedings of 1st NeCST Workshop, Networked Control Systems & Fault Tolerant Control, pp 163-171, 6-7 Oct 2005, Ajaccio, France.

Molnar L., Omerdic E., Toal D., Design of an advanced AUV for deployment close to the seabed and other hazards, In Proceedings of IEEE Oceans '05 Europe Conference, Brest, France, June 2005, ISBN; 0-7803-9104-7 (CD ROM).

Sousa R. V. de, Inamasu, R. Y., Porto A. J. V., Toal D., Flanagan C., Composition and coordination of reactive fuzzy behaviors for autonomous navigation of a mini-robot platform. In: 18th International Congress of Mechanical Engineering, 2005, Ouro Preto - MG. 18th International Congress of Mechanical Engineering, 2005.

Nolan S., Toal D., Ewald H., A novel wideangle ultrasonic sensor utilizing a curved radiator developed for use in an AUV obstacle avoidance system, In Proceedings of IEEE Oceans '05 Europe Conference, Brest, France, June 2005, ISBN; 0-7803-9104-7 (CD ROM).

Riordan J., Omerdic E., Toal D., Implementation and application of a real-time sidescan sonar simulator, In Proceedings of IEEE Oceans '05 Europe Conference, Brest, France, June 2005, ISBN; 0-7803-9104-7 (CD ROM)

## ***Keynote & Invited Lectures '05***

### ***Patents '05***

### ***Other '05***

"Optical Fibre Sensors Monitor Pollutants from Road Vehicles to Help Implement Euro Emission Standards" Parliament Magazine (European Politics and Policy), Issue 208, 5th Sept 2005, pp33

"Optical Fibre Sensors Monitor Pollutants from Road Vehicles to Help Implement Euro Emission Standards" The House Magazine, Labour Conference (UK) Special, No. 114, September 26, 2005, pp167

Opto & Laser Europe June 2005 Issue 129 "All-optical sensing deals with vehicle emissions" pp 47-48

Food Manufacture "Optic fibres help cook the golden chicken" 04 April, pg 33, 2005

## **Charles Parsons Initiative On Energy & Sustainable Environment**

### **Selected Publications**

O'Regan, B. (Ed.), 2005 Jamniczky-Kaszas, D. Byrne, P., McLoone, A, Moles, R. Closed cycle study of the timber processing sector. Udaras na Gaeltachta EcoLAND Project.



## Charles Parsons Initiative On Energy & Sustainable Environment

### Selected Publications

## PUBLICATIONS 2004

### *Refereed Journals '04*

T.J. Cary, A.J. Palazzo, T.L. Bashore, N. Senesi, G. Brunetti, C.E. Clapp, J.J. Clapp, M.H.B. Hayes, K. Schmidt-Rohr, and J. D. Mao. 2004. Isolation and characterization of humic acids in soil collected at Juniper Butte Range, Idaho. Proc. 12th Intern. Conf. IHSS (San Pedro), 175-177.

Corinna Maria Byrne, C.Edward Clapp, and Michael H.B. Hayes. 2004. Transformations of plants to humic substances. Proc. 12th Intern. Conf. IHSS (San Pedro), 247-250.

Fitzpatrick, C., C O'Donoghue, J Schöbel, B Bastiaens, P van der Slot, E Lewis and D Pendrill, "A large core polymer optical fibre sensor for x-ray dosimetry based on luminescence occurring in the cladding" Meas. Sci. Technol. Vol. 15 Iss. 8(2004) pp1586-1590

Julieta A. Ferreira, Jingdong Mao, Michael H. B. Hayes, Ana Belen Pedrosa, Betania F. Pereira, Giuxue Song, and Klaus Schmidt-Rohr. 2004. NMR evidence for differences in humic fractions. Proc. 12th Intern. Conf. IHSS (San Pedro), 348-351.

Betânia Fraga Pereira, Antonio Salvio Mangrich, Michael H. B. Hayes, Iara Messerschmidt, Fabio Andrade Silva, Julieta Adriana Ferreira. 2004. EPR, NMR and Drift Spectroscopy data, analyzed by chemometric methods, for considerations of chemical structures of humic substances from soils in different management systems. Proc. 12th Intern Conf. IHSS (San Pedro), 291-293.

Herlihy, M., McCarthy, J., Breen, J. and Moles, R. 2004 'Effects over time of fertiliser P and soil series on P balance, soil test P and herbage production.' Irish Journal of Agricultural and Food Research 43, 147-160.

King, D., W.B. Lyons, C. Flanagan and E. Lewis. "An Optical-Fiber Sensor for Use in Water Systems Utilizing Digital Signal Processing Techniques and Artificial Neural Network Pattern Recognition", IEEE Sensors Journal 4(1), (2004) 21-27.

King, D., W.B. Lyons, C. Flanagan and E. Lewis. "Interpreting Complex Data From a Three-Sensor Multipoint Optical Fibre Ethanol Concentration Sensor System Using Artificial Neural Network Pattern Recognition", Measurement Science Technology 15(8), (2004) 1560-1567.

King, D., W.B. Lyons, C. Flanagan and E. Lewis. "A Multipoint Optical Fibre Sensor System For Use In Process Water Systems Based on Artificial Neural Network Techniques", Sensors and Actuators A:Physical 115(2-3), (2004) 293-302

Lyons, W. B., C. Fitzpatrick, C. Flanagan and E. Lewis "A novel multipoint luminescent coated ultra violet fibre sensor utilising artificial neural network pattern recognition techniques" Sensors & Actuators A:Physical, Vol. 115 Issues 2-3, Sept 2004, pg 267-272.

Lyons W. B., C. Flanagan, E. Lewis, H. Ewald and S. Lochmann. "Interrogation of Multipoint Optical Fibre Sensor Signals Based on Artificial Neural Network Pattern Recognition Techniques", Sensors and Actuators A-Physical, Vol. 114 Issue 1, August 2004, pg 7-12.

R.J. McInerney, M.H.B. Hayes, C.E. Clapp, P. Cross, and P. Pereira. 2004. Compositions of humic-type substances from *Ascophyllum nodosum* and the influences on grass growth of seaweed extracts and other organic amendments. Proc. 12th Intern. Conf. IHSS (San Pedro), 226-229.

## **Charles Parsons Initiative On Energy & Sustainable Environment**

### **Selected Publications**

- McSherry, M., C. Fitzpatrick and E. Lewis, "The Development and Investigation of Narrowband Luminescent Coatings for Germicidal Ultra Violet Optical Fibre Sensors", IEEE Sensors Journal Vol. 4 Issue 5 October 2004 pp 619-627.
- Molnar L., Omerdic E., van de Ven P., Toal D., Flanagan C., On the development of Tethra submersible vehicle for autonomous and remotely operated modes, WSEAS Transaction on Systems, pp. 2454-2460, Issue 6, Volume 3, August 2004, ISSN 1109-2777.
- O'Farrell, M., E. Lewis, C. Flanagan, W. B. Lyons and N. Jackman, "Using a Reflection based Optical Fibre System and Neural Networks to Evaluate the Quality of Food in a large-scale Industrial Oven", Sensors & Actuators: A. Physical, 115, pp424-433, 2004
- O'Regan, B. and Moles, R. 2004 'The dynamics of relative attractiveness- a case study in mineral exploration and development.' Ecological Economics 49, 73-87.
- Andre J. Simpson, Li-Hong Tseng, Myrna J. Simpson, Manfred Spraul, Ulrich Braumann, William L. Kingery, Brian P. Kelleher, and Michael H. B. Hayes. 2004. The application of LC-NMR and LC-SPE-NMR to compositional studies of natural organic matter. Analyst, 129, 1216-1222.
- Guixue Song and Michael H.B.Hayes. 2004. Isolation, fractionation, and characterization of humic substances from a maize-amended soil. Proc. 12th Intern. Conf. IHSS (San Pedro), 327-331.
- Tierney, E., T. Newe and T. Coffey. 2004. "Cox's Algorithm: strengths and weaknesses with varying composition digital images", Transactions on Communications, Issue 1, Volume 3, January 2004. pp 10-15. ISSN 1109-2742.
- Toal D., Flanagan C., Whisker sensors enable AUV deployment near hazards, WSEAS Transactions on Computers, Issue 3, Volume 3, pp 759 - 765, July 2004, ISSN 1109-2750
- Ventuneac, M., T. Coffey and T. Newe. 2004. "Reasoning on Properties of Non-Repudiation Security Protocols", in: Transactions on Information Science and Applications, Issue 5, Volume 1, pp 1262-1267, Nov 2004. ISSN 1790-0832.

### ***Books & Chapters In Books '04***

### ***Refereed Conference papers '04***

- Coffey, T., Ventuneac M., Newe T., 2004. "Reasoning on Properties of Non-repudiation Security Protocols", Published in Special Session on Network and Data Security in the 6th WSEAS International Conference on E-ACTIVITIES, Rethymno, Crete Island, Greece, October 24-26, 2004.
- Coffey, T., Ventuneac, M., Newe, T., Salomie, S., 2004. "On investigating the security and fairness of a fair exchange protocol using logic- based verification", in: Proceedings of IEEE International Conference on Intelligent Engineering Systems (INES2004), Cluj-Napoca, Romania, pp 325-330, U.T.Pres 2004, ISBN: 973-662-120-0.
- Grout, I.A., J. Walsh, C. Fitzpatrick and D.J. Heffernan, "Remote accessibility experiment for optical fibre sensor tester", Proceedings of the REV 2004 Symposium, Villach, Austria, 28th-30th September 2004.

## Charles Parsons Initiative On Energy & Sustainable Environment

### Selected Publications

King, D., Lyons W.B., Flanagan C., Lewis E., "A Multipoint Optical Fibre Sensor System For Use in Process Water Systems Based on Artificial Neural Network Pattern Recognition", (University of Rome Tor Vergata) Proc 18th Conference on Solid-State Sensors (Eurosensors XVIII), Rome, Italy, (2004) 357-358.

King, D., Lyons W.B., Flanagan C., Lewis E., "A Three Sensor Multipoint Optical Fibre Sensor System Utilising Fourier Transform Signal Processing and Artificial Neural Network Pattern Recognition", (IOP) Proc Photon 04, Glasgow, Scotland, (2004) 57.

Leahy, M.J., J. O'Doherty and N. Clancy. 'Influence of coherence length on tissue perfusion depth of measurement', Biomedical Topical Meetings on CD-ROM (The Optical Society of America, Washington, DC, Dec 2004), FH3.

Leahy, M.J., N. Clancy and J. O'Doherty. 'Optimising reflection-based pulse oximeters', Biomedical Topical Meetings on CD-ROM (The Optical Society of America, Washington, DC, Dec 2004), ThF5.

Lyons, W.B., C. Fitzpatrick, C. Flanagan, E. Lewis, P.W.J. Van De Ven, H. Ewald, "An Intelligent Interrogation of a Fibre Optic Based Multipoint Ultra Violet (UV) Sensor" Proc. 14th Artificial Neural Networks in Engineering (ANNIE) 2004, St. Louis, USA (Nov 2004) pp 597-602.

Lyons, W.B., Fitzpatrick, C., Flanagan, C., Lewis, E., Van De Ven, P.W.J., Ewald, H., "An Intelligent Interrogation of a Fibre Optic Based Multipoint Ultra Violet (UV) Sensor" Proc. 14th Artificial Neural Networks in Engineering (ANNIE) 2004 conference, St Louis, USA (Nov 2004) pp 597-602, ISBN 0-7918-0228-0

McSherry, M., C. Fitzpatrick and E. Lewis, "Investigation & Development of a Fibre Optic Temperature Sensor for Monitoring Liquid Temperature in a High-Power Microwave Environment" Proceedings of the Second European Workshop on Optical Fibre Sensors EWOFS '04, 9-11 June 2004, Santander, Spain, SPIE Volume 5502, pp 80-83.

McSherry, M., C. Fitzpatrick and E. Lewis, "Development of an Extrinsic Optical Fibre Temperature Sensor for Monitoring Liquid or Surface Temperatures in Harsh Industrial Environments", Photon '04, Glasgow, UK, 6th-9th September 2004, pp 14.

McSherry, M., C. Fitzpatrick and E. Lewis, "Development of temperature sensitive glassware for monitoring of liquid temperatures in harsh industrial environments", Proceedings of 18th European Conference on Solid-State Sensors (Eurosensors XVIII), September 12th-15th 2004, Rome, Italy, pp 768-770.

Mulrooney, J., J. Clifford, C. Fitzpatrick and E. Lewis. "A mid infrared optical fibre sensor for measurement of carbon dioxide", Proceedings of 18th European Conference on Solid-State Sensors (Eurosensors XVIII), September 12th-15th 2004, Rome, Italy, pp 197-199.

Mulrooney, J., C. Fitzpatrick and E. Lewis. "Novel Approach to U-Bend Fibre Optic Sensor Systems for Environmental Gas Monitoring Systems" Proc 8th World Multiconference on systemics, Cybernetics and Informatics, Orlando, Florida, July 18-21, 2004, <http://www.iiisci.org/sci2004/website/default.asp> ISBN 980-6560-14-0

Mulrooney, J., C. Fitzpatrick and E. Lewis. "A Proposed Optical Fibre Sensor for Exhaust Gas Emissions Using Mid-Infrared Spectroscopy", Proceedings of 14th Irish Environmental Researchers Colloquium Environ 2004, 30th Jan – 1st Feb 2004, pp99-100.

Mulrooney, J., C. Fitzpatrick and E. Lewis. "Towards a Mid-Infrared Optical Fibre Sensor for Exhaust Gas Emissions" Proceedings of the Second European Workshop on Optical Fibre Sensors EWOFS '04, 9-11 June 2004, Santander, Spain, SPIE Volume 5502, pp 255-258.

## Charles Parsons Initiative On Energy & Sustainable Environment

### Selected Publications

- O'Farrell, M., E. Lewis, C. Flanagan, W.Z. Zhao, T. Sun, K.T.V. Grattan, W.B. Lyons and N. Jackman "An All Optical Method for Assessing Food Quality During Cooking In Large Scale Industrial Ovens Based on Intelligent Monitoring of Colour and Temperature" Proc. International Symposium on Advances and Trends in Fiber Optics and Applications, Chongqing, China, pp315-319, 11-15 October 2004
- O'Keefe, S., C. Fitzpatrick, A. Fernandez Fernandez, B. Brichard, F. Berghmans and E. Lewis, "valuation of PMMA optical fibres as gamma dosimeters for nuclear applications" POF 2004 The 13th International Conference on Polymer Optical Fibre, Nurnburg, Sept 2004, pp364-370
- O'Farrell, M., E. Lewis, C. Flanagan, K.T.V. Grattan, T. Sun and N. Jackman, "A Combined Optical Fibre-Based System that measures the Quality and Temperature of Food in a Full-Scale Production Environment" Proc. Europtrode VII, 7th European Conference on Optical Chemical Sensors and Biosensors, Madrid, Spain, p60, 4-7th April 2004
- O'Farrell, M., E. Lewis, C. Flanagan, W.B. Lyons and N. Jackman, "Principal Component Analysis and Pattern Recognition combined with Visible Spectroscopy in the Classification of Food Quality" Proc. IEEE Sensors 2004 3rd International Conference, Vienna, Austria, 24-27 October 2004
- O'Farrell, M., E. Lewis, C. Flanagan, W.B. Lyons and N. Jackman, "Employment of Neural Network with Principal Component Analysis for the Online Classification of food products in a Large-Scale Industrial Oven" Proc. Photon04, Glasgow, Scotland, 6-9 September 2004
- O'Farrell, M., E. Lewis, C. Flanagan, W.B. Lyons and N. Jackman, "Employing Spectroscopic and Pattern Recognition Techniques to examine Food Quality both Internally and Externally as it Cooks in an Industrial Oven" Proc. European Workshop on Optical Fibre Sensors, Santander, Spain, pp 313-316, 9-11 June 2004
- O'Farrell, M., E. Lewis, C. Flanagan, W.B. Lyons and N. Jackman, "Quality Classification of Cooked Foods in terms of Aesthetics using Pattern Recognition and Karhunen Loeve Decomposition." Proc. Eurosensors XVIII, Rome, Italy, pp367-368, 13-15 September 2004
- Sheridan, C., M. O'Farrell, W.B. Lyons, E. Lewis, C. Flanagan and N. Jackman, "Using artificial neural networks combined with PCA in an optical fibre system that monitors food colour in a full-scale production environment", Proc. 14th Artificial Neural Networks in Engineering (ANNIE), 14, pp. 879-884, 2005
- Tierney, E., T. Newe and T. Coffey. 2004. "Cox's Algorithm: strengths and weaknesses with varying composition digital images", 6th WSEAS International Conference on TELECOMMUNICATIONS AND INFORMATICS (TELE-INFO '04), Cancun, Mexico, May 12-15, 2004. ISBN 960-8052-98-X
- Van de Ven P., Flanagan C., Toal D., Omerdic E. (2004) Identification and control of underwater vehicles with the aid of neural networks, In Proceedings of 2004 IEEE Conference on Cybernetics and Intelligent Systems (CIS) and IEEE Conference on Robotics, Automation and Mechatronics (RAM), Singapore, December 2004, pp 428 – 433.
- Van de Ven P., Flanagan C., Toal D. (2004) Identification of underwater vehicle dynamics with neural networks, In Conference proceedings of Oceans '04, Kobe, Japan, November 2004, pp 1198 – 1204.
- Van de Ven P., Flanagan C., Toal D., Omerdic E., Lyons W., Underwater vehicle model identification with the aid of neural networks, In: Smart Engineering System Design, Proc. of the Artificial Neural Networks in Engineering (ANNIE 2004) Conf., pp. 559-64, St. Louis, Missouri, USA, November 2004.
- Molnar L., Omerdic E., Van de Ven P., Toal D., Flanagan C., On the development of tethra submersible vehicle for autonomous and remotely operated modes, In: 4th WSEAS Int. Conf. on Robotics, Distance Learning and Intelligent, Communication Systems - ICRODIC 2004, Izmir, Turkey, September 13-16, 2004, pp 489 - 497.

## **Charles Parsons Initiative On Energy & Sustainable Environment**

### **Selected Publications**

Toal D., Flanagan C. and Hayes J., "Equipping autonomous underwater vehicles with manipulators", 3rd IFAC Symposium on Mechatronic Systems, September 6-8, 2004 Sydney. Invited paper for special session on Marine Robotics.

Van de Ven, P., Johansen T.A., Sorensen A., Flanagan C. and Toal D. (2004) "Neural network augmented identification of underwater vehicle models", In: Proceedings of the IFAC Conference on Control and Applications in Marine Systems (CAMS '04), Ancona, Italy, 7-9 July 2004 .

Nolan S, Toal D, Flanagan C, " Sensor system approaches to provide perspacity in AUV object detection", 11th Symposium Maritime Elektrotechnik, Elektronik und Informationstechnik, pp 107-110, Universität Rostock. June 2004.

Riordan J., Toal D., Flanagan C., "Development of a sidescan sonar simulation model", 11th Symposium Maritime Elektrotechnik, Elektronik und Informationstechnik, pp115-118, Universität Rostock. June 2004.  
Riordan J., Toal D., Flanagan C., "Sidescan sonar modelling for imaging performance characterisation", GeoHAB 2004, Galway, Ireland.

Molnar L., Toal D., Flanagan C., Hayes M. (2004 ). The Tethra autonomous underwater vehicle platform: system description and controller development. Advances in technology for underwater vehicles (ATUV). Two-day international conference at Oceanology '04 London, UK.

Toal D., Flanagan C., (2004) "Whisker sensors enable mini AUV deployment near hazards", In Proceedings of 3rd WSEAS Int.Conf. on Signal Processing, Robotics and Automation (ISPRA 2004), Salzburg Austria. ISBN: 960-8052-95-5.

## **Keynote & Invited Lectures '04**

### **Patents '04**

### **Other '04**

Newe, T. 2004, "Verification of Security Protocols using Formal Logics", Data Communications Security Laboratory Seminar Series 2004, University of Limerick, 22 July, 2004.

Moles, R. and O'Regan, B. 2004 Sustainable Development Research: Gaps and Opportunities for Ireland. Environmental Protection Agency: Environmental Research, Technological Development and Innovation Programme 2000-2006. Sustainable Development Research – Gaps and Opportunities for Ireland. Report at [www.epa.ie](http://www.epa.ie).

"An Optical Fibre Based System that Classifies Food Aesthetically as it cooks in a Large-Scale Industrial Oven", M. O'Farrell, E. Lewis, C. Flanagan, W.B. Lyons, N. Jackman. "Using Pattern Recognition Article in Matrix Magazine" (Published By Ocean Optics (Europe) Inc) Issue 4, 2004

The Irish Scientist Year Book 2004 "An Optical Fibre Sensor based intelligent system for monitoring and control of exhaust emissions from road vehicles - coming to a dashboard near you soon!!" pp 109, 2004

## **Charles Parsons Initiative On Energy & Sustainable Environment**

### **Selected Publications**

Moles, R. and O'Regan, B. Sustainable Development Research: Gaps and Opportunities for Ireland. Environmental Protection Agency: Environmental Research, Technological Development and Innovation Programme 2000-2006. Sustainable Development Research – Gaps and Opportunities for Ireland. Report at [www.epa.ie](http://www.epa.ie).

## PUBLICATIONS 2003

### *Refereed Journals '03*

Aslibekian, O. and Moles, R. 2003 Environmental risk assessment of metals contaminated soils at Silvermines abandoned mine site, co Tipperary, Ireland.' *Environmental Geochemistry and Health* 25(2), 247-266.

Flanagan C, **Toal D** & Leyden M, Subsumption and fuzzy logic, experiments in behaviour-based control of mobile robots. *International J of Smart Engineering Systems Design*, Vol 5, Issue 3, pp 161-175, 2003. Taylor & Francis ISSN 1025-5818 print/1607-8500 online.

Fitzpatrick, C., P. Mavromatidis, E. Lewis, L. Lucas and A. Al-Shamma's. 2003. "Experimental investigation into low pressure gas discharges in microwave electric field optical sensor probes" *Sensor Review*, Vol. 23, No. 1, pp44-47. ISSN 0260-2288

Fitzpatrick, C., E. Lewis, A. Al-Shamma'a and J. Lucas "An Optical Fibre Sensor for On-Line Temperature Control of Germicidal Microwave Plasma Powered UV Lamps", *Measurement* Vol 33 (2003) pp 341-346. ISSN 0263-2241.

Fitzpatrick, C, C. O' Donoghue, E. Lewis and I. Grout. "A Coating Process For Multi-Point Luminescent Clad Fibre Optic Sensors", *Optical Review*, Vol.10, No.4, pp330-334. ISSN 1340-6000.

Fitzpatrick, C, C. O' Donoghue and E. Lewis. "A Novel Multi-Point Ultra Violet Optical Fibre Sensor Based on Cladding Luminescence" *Measurement Science and Technology* Vol. 14 (2003) pp1477-1483. ISSN 0957-0233

Fitzpatrick, C., C. O'Donoghue, E. Lewis, J. Schobel, B. Bastaiens and P. van der Slot, "Radioluminescent Clad Optical Fibre X-ray Sensor", *Electronics Letters*, Vol 39. No.22 (2003) pp 1575-1576

King, D., W.B. Lyons, C. Flanagan and E. Lewis. "An Optical Fibre Ethanol Concentration Sensor Utilizing Fourier Transform Signal Processing Analysis and Artificial Neural Network Pattern Recognition", *Journal of Optics A: Pure and Applied Optics* 5(4), (2003) S69 – S75.

Lyons, W.B., H. Ewald, C. Flanagan and E. Lewis. "A Multi Point Optical Fibre Sensor For Condition Monitoring In Process Water Systems Based On Pattern Recognition" *Measurement* Volume 34, Issue 4, December 2003, Pages 301-312

McSherry, M., C. Fitzpatrick, E. Lewis, A. Al-Shamma'a, I. Pandithas and J. Lucas. "A Narrow Band Photoluminescent Optical Fibre Sensor for the Detection of High Intensity Germicidal UV Radiation(254nm) from a Microwave Plasma UV Lamp",

McSherry, M. *Journal of Optics A : Pure & Applied Optics*, Vol. 5 (2003), pp S63-S68. ISSN 1464-4258.

Moles, R., Hayes, K., O'Regan, B. and Moles, N. 2003 'The impact of environmental factors on the distribution of plant species in a Burren grassland patch: implications for conservation'. *Biology and Environment: Proceedings of the Royal Irish Academy*, 103B(3), 139-145.

Newe, T. and T. Coffey. 2003. "Formal Verification Logic for Hybrid Security Protocols". *International Journal of Computer Systems Science and Engineering*, Vol. 18 no 1, January 2003, pp 17-25. ISSN 0267

## **Charles Parsons Initiative On Energy & Sustainable Environment**

### **Selected Publications**

Newe, T. and T. Coffey. 2003. "Minimum-Knowledge Schemes for low-power, low-memory Devices", Transactions on Circuits and Systems, Issue 2, Volume 2, April 2003. pp 460-465. ISSN 1109-2734.

O'Farrell, M., E. Lewis, C. Flanagan, W. Lyons and N. Jackman. "Intelligent Processing of Spectroscopic Signals obtained using an Optical Fibre Based System for Food Quality Control" International Journal of Smart Engineering System Design, 5(4), pp 409-416, October-December 2003.

O'Regan, B. and Moles, R. 2003 'Modelling policies and decisions. A case study in mineral extraction'. Information and Management, 40, 147-157.

### **Books & Chapters In Books '03**

Van de Ven, P, Flanagan C., and Toal D. "Artificial intelligence for the control of underwater vehicles", In: Smart Engineering System Design, Proc. of the Artificial Neural Networks in Engineering (ANNIE 2003) Conf., pp. 559-64, St. Louis, Missouri, USA, 2-5 November 2003.

Dooly G., Toal D., Lewis E., Lyons W., "An optical fibre sensor for underwater proximity measurement", Institute of Physics Series in Sensors, Proc. Sensors and Their Applications XII, 2003, pp 511-517, IOP publishing, S&A XII Limerick, ISBN 0-7503-0978-4 .

Hayes J., Toal D., Flanagan C., 'Robot arm control approach for an autonomous mobile robot such as an AUV'. 4th International Conference on Industrial Automation, 9-11 June 2003, Montréal.

Nolan S., Love T., Molnar L., Toal D. and Flanagan C., "A submersible robot test-bed implemented for autonomous controller development", Proc. Irish Signals and Systems Conference 2003', pp. 458—463, June 2003, Limerick. ISBN 0-9542973-1-8.

Love T., Toal D., Flanagan C., 'Buoyancy control for an autonomous underwater vehicle'. In: Guidance and Control of Underwater Vehicles 2003: Proceedings of the IFAC Workshop, Newport, UK, April 9-11 2003, Eds. G. Roberts, R. Sutton & R. Allen, Elsevier 2003, pp 199-204, ISBN 0-08-044202-1.

Nolan S., Molnar L., Toal D., Flanagan C., "Implementing a layered control architecture on an open framed AUV". In: Guidance and Control of Underwater Vehicles 2003: Proceedings of the IFAC Workshop, Newport, UK, April 9-11 2003, Eds. G. Roberts, R. Sutton & R. Allen, Elsevier 2003, pp 61-66, ISBN 0-08-044202-1.

Van de Ven, P., Flanagan C., Toal D., "A survey of AI techniques for the control of underwater vehicles". In: Guidance and Control of Underwater Vehicles 2003; Proceedings of the IFAC Workshop, Newport, UK, April 9-11 2003, Eds. G. Roberts, R. Sutton & R. Allen, Elsevier 2003, pp 145-199, ISBN 0-08-044202-1.

Hayes J., Toal D., Flanagan C., "Development and implementation of robot arm control for an autonomous mobile robot such as an AUV", Proc. ICSE 2003 16th International Conference on Systems Engineering, Vol 1, pp 237-242, Coventry University, ISBN 0-905949-91-9.

Riordan J., Toal D., Young T., "Development of a low cost fixed base flight simulator", Proc. ICSE 2003, 16th International Conference on Systems Engineering, Vol 2, pp 586-590, Coventry, ISBN 0-905949-91-9.



## Charles Parsons Initiative On Energy & Sustainable Environment

### Selected Publications

#### **Refereed Conference papers '03**

Dooly G., Toal D., Lewis E., Lyons W., "An optical fibre sensor for underwater proximity measurement", Institute of Physics Series in Sensors, Proc. Sensors and Their Applications XII, 2003, pp511-517, IOP publishing, S&A XII Limerick, ISBN 0-7503-0978-4.

Fitzpatrick, C., C. O'Donoghue and E. Lewis, "A Spectrally Resolved Multi-Point Optical Fibre Ultra Violet Sensor Using Cladding Luminescence" Eurosensors XVII The 17th European Conference on Solid State Transducers, pp 292-293, Guimaraes, Portugal Sept 2003. ISBN 972-98603-1-9.

Fitzpatrick, C., C. O'Donoghue, J. Schöbel, B. Bastiaens, P. van der Slot, E. Lewis, "A Distributed Optical Fibre X-Ray Sensor Based on Cladding Luminescence" OFS-16 The 16th International Conference on Optical Fiber Sensors, pp 658-661, Nara, Japan, October 2003, ISBN 4-89114-036-4

Fitzpatrick, C., W.B. Lyons, C. Flanagan and E. Lewis. "A Novel Multi-Point Luminescent Coated Ultra Violet Fibre Sensor Utilising Pattern Recognition" ANNIE 2003 Intelligent Engineering Systems Through Artificial Neural Networks 13, pp 607-612, 2nd-5th Nov 2003, St. Louis, USA.

King, D., W. B. Lyons, C. Flanagan. and E. Lewis. "A Dual Element Multipoint Optical Fibre Water Contamination Sensor System Utilising Artificial Neural Network Pattern Recognition", (IEEE) Proc Second IEEE International Conference on Sensors (IEEE Sensors 2003) 1, Toronto, Canada, (2003) 397 – 402.

King, D., W. B. Lyons, C. Flanagan. and E. Lewis. "A Dual Element Multipoint Optical Fibre Water Sensor System Utilising Fourier Transform Signal Processing and Artificial Neural Network Pattern Recognition", (University of Guimares) Proc The 17th European Conference On Solid – State Transducers (Eurosensors XVII), Guimares, Portugal, (2003) 1120 – 1123.

King, D., W. B. Lyons, C. Flanagan. and E. Lewis. "A Dual Element Optical Fibre Water Contamination Sensor Utilising Artificial Neural Network Pattern Recognition Coupled with Digital Signal Processing Techniques", (IOP) Proc Twelfth Conference on Sensors and Their Applications (S&A XII), Limerick, Ireland, (2003) 303 – 309.

King, D., W. B. Lyons, C. Flanagan. and E. Lewis. "A Two Sensor Multipoint Optical Fibre Ethanol Concentration Sensor Utilising Fourier Transform Techniques Coupled With Artificial Neural Network Pattern Recognition", (IEICE) Proc 16th International Conference on Optical Fiber Sensors (OFS-16), Nara, Japan, (2003) 404 – 407.

King, D., W. B. Lyons, C. Flanagan. and E. Lewis. "Interpreting Complex Data From a Dual Element Multipoint Optical Fibre Sensor System For Use In Process Water Systems", (ASME) Proc Artificial Neural Networks in Engineering - Intelligent Engineering Systems Through Artificial Neural Networks 13 (ANNIE 2003), St.Louis, Missouri, USA, (2003) 975 – 980.

King, D., W. B. Lyons, C. Flanagan. and E. Lewis. "An Optical Fibre Sensor System For Water Quality Monitoring Utilising Fourier Transform Techniques and Artificial Neural Network Pattern Recognition", (University of Limerick) Proc Irish Signals and Systems Conference 2003 (ISSC 2003), Limerick, Ireland, (2003) 224 – 230.

Lyons, W.B., C. Fitzpatrick, E. Lewis and C. Flanagan, "A Smart Multi-Point Plastic Optical Fibre Sensor Utilising Neural Network Pattern Recognition" POF 2003 The 12th International Conference on Polymer Optical Fibre, pp 58-61. Seattle, Sept 2003.

Lyons, W. B., C. Fitzpatrick., E. Lewis and C. Flanagan. "A Smart Multi-Point Plastic Optical Fibre Sensor Utilising Neural Network Pattern Recognition" In Proceedings of the 12th Conference on Plastic Optical Fibers (POF 2003), pp. 58-61, (2003)

## **Charles Parsons Initiative On Energy & Sustainable Environment**

### **Selected Publications**

O'Farrell, M., E. Lewis, C. Flanagan, K.T.V. Grattan, T. Sun and N. Jackman. "A Combined Optical Fibre Temperature and Colour Sensor for Automation of the Cooking Process in a Large Scale Industrial Oven", Proc. Sensors and their Applications XII, Limerick, 12, pp.13-20, September 2003

Mavromatidis, P, C. Fitzpatrick, A. Al-Shamma'a and J. Lucas, "Sensing of the Microwave High Velocity Thermal Spraying" Sensors & Applications XII, Limerick, pp 365-370, Sept 2003. ISBN 0-7503-0978-4.

McSherry, M, C. Fitzpatrick and E. Lewis, "Investigation of a Luminescent based Technique for Surface Temperature Measurements" Sensors & Applications XII, pp393-398, Limerick Sept 2003. ISBN 0-7503-0978-4.

McSherry, M., C. Fitzpatrick. and E. Lewis. "A narrowband luminescent coated optical fibre sensor for monitoring a microwave plasma UV lamp", Irish Systems & Signals Conference, Limerick, pp 4-9, ISBN 0-9542973-1-8

McSherry, M., C. Fitzpatrick, and E. Lewis. "Investigation of a Luminescent Coating for Monitoring Liquid Temperature in a Microwave Environment" IEEE Sensors 2003 2nd IEEE International Conference on Sensors, pp102-103, Toronto, Canada, 22-24 October 2003

Newe, T. and T. Coffey. 2003. "On the Logical Verification of Key Exchange Protocols for Mobile Communications". Proceedings of the 7th WSEAS International Conference on COMMUNICATIONS, Corfu Island, Greece, July 7-10, 2003. ISBN:960-8052-82-3.

Newe, T. and T. Coffey. 2003. "Security Protocols for 2G and 3G Wireless Communications". ISICT 03, International Symposium on Information and Communication Technologies, Trinity College Dublin, Ireland, September 24-26, 2003. pp 348-353. ISBN 0-9544145-2-7

Newe, T. and T. Coffey. 2003. Invited Paper: "Minimum-Knowledge Schemes for low-power, low-memory Devices", 3rd WSEAS Int. Conf. on APPLIED INFORMATICS AND COMMUNICATIONS (AIC'03), Rhodes Island, Greece, Nov 15-17, 2003. ISBN 960-8052-90-4.

O'Farrell, M., E. Lewis, C. Flanagan and N. Jackman. "An Optical Fibre Based System used for the Intelligent Monitoring of Food Quality" Proc. Irish Signals and Systems Conference Limerick, pp 28-32, 30th June to 2nd July 2003

O'Farrell, M., E. Lewis, C. Flanagan, W.B. Lyons and N. Jackman, "A Method for Assessing Quality of Food Products based on Optical Spectra using Intelligent Pattern Recognition in a Full Scale Production Environment" Proc. ANNIE 2003: Intelligent Engineering Systems Through Artificial Neural Networks, 13, pp945-950, Nov. 2003

O'Farrell, M., E. Lewis, C. Flanagan, W.B. Lyons and N. Jackman, "Controlling a Large-Scale Industrial Oven by monitoring the Food Quality both Internally and Externally using an Optical Fibre Based System." Proc. IEEE Sensors 2003 2nd International Conference, Toronto, pp.104-105, Oct. 2003

O'Farrell, M., E. Lewis, C. Flanagan, W.B. Lyons and N. Jackman, "Using Optical Spectra and Intelligent Pattern Recognition to Evaluate the Quality of Food in a large-scale Industrial Oven." Proc. Eurosensors, The 17th European Conference on Solid-State Transducers, pp594-595, Sept. 2003

Walsh, J, I. Grout, C. Fitzpatrick, P. Quinn and E. Lewis "A System For Improving the Testability of Luminescent Clad Fibre Optic Sensors" Sensors & Applications XII, pp 457-462, Limerick Sept 2003. ISBN 0-7503-0978-4.

Zhao, W. Z., Y.H. Shen, T. Sun, K.T.V. Grattan, E. Lewis, M. McSherry, C. Fitzpatrick, A.I. Al-Shamma'a and J. Lucas, "Precision free electron laser materials adhesion monitoring using optical fibre temperature

## **Charles Parsons Initiative On Energy & Sustainable Environment**

### **Selected Publications**

sensor system” OFS-16 The 16th International Conference on Optical Fiber Sensors, pp248-251, Nara, Japan, October 2003, ISBN 4-89114-036-4

### ***Keynote & Invited Lectures '03***

### ***Patents '03***

O'Farrell, M., E. Lewis, C. Flanagan and N. Jackman""Food Monitoring System” S2003/0130, 2003

### ***Other '03***

Toal D & Flanagan C. Robots and the Deep Blue Yonder. The Irish Scientist, 2003 Yearbook, No 11

## Charles Parsons Initiative On Energy & Sustainable Environment

### Selected Publications

## PUBLICATIONS 2002

### *Refereed Journals '02*

- Byrne, P., Moles, R. and Breen, J. 2002 'Trichostrongylus tenuis in Irish red grouse at a site in Co. Limerick', *Irish Naturalists Journal*, 27, 73-75.
- Kelly, R. and Moles, R. 2002 'The development of Local Agenda 21 in the Mid-West region of Ireland: a case study in interactive research and indicator development.' *Journal of Environmental Planning and Management*, 45(6), 889-912.
- Lyons, W.B., H. Ewald and E. Lewis. (2002) "An optical fibre distributed sensor based on pattern recognition" *Journal of Materials Processing Technology*, Vol. 127 (No.1) (2002), pp 23-30
- R. McDonnell, N.M. Holden, S.M. Ward, J.F. Collins, E.P. Farrell, and M.H.B. Hayes. 2002. Characteristics of humic substances in heathland and forested peat soils of the Wicklow mountains. *Biology and the Environment*. 101B, 187-197.
- Moles, R. and Hayes, K. 2002 'Evaluating biodiversity through functional groups: a comparison of functional groups and biodiversity measures'. *Biology and Environment: Proceedings of the Royal Irish Academy*, 102B(2), 113-117.
- Moles, N. and Moles, R. 2002 'Influence of geology, glacial processes and land use on soil composition and Quaternary landscape evolution in the Burren National Park, Ireland.' *Catena*, 47, 291-321.
- A.J. Simpson, W.J. Kingery, M.H.B. Hayes, M. Spraul, E. Humpfer, P. Dvortsak, R. Kerssebaum, M. Godejohann, and M. Hofmann. 2002. Molecular structure and associations of humic substances in the terrestrial environment. *Naturwissenschaften* 89, 84-88.
- O'Regan, B. and Moles, R. 2002 'Investment decisions of international mining firms: policy approaches'. *Simulation*, 78(6), 362-379.
- O'Regan, B., Moles, R., Kelly, R., Ravetz, J. and McEvoy, D. 'Developing indicators for the estimation of sustainable settlement size in Ireland.' *Journal of Environmental Management and Health*, 13(5), 450-466.
- Toal D.**, Flanagan C., "Pull to position, a different approach to the control of robot arms for mobile robots" In *Journal of Materials Processing Technology*, May 2002, Vol 12 3/2-3, pp 393-398, Elsevier. ISI:000176486200011

### *Books & Chapters In Books '02*

- J. Skjemstad, M.H.B. Hayes, and R.S. Swift. 2002. Changes in natural organic matter during aquifer storage. In P.J. Dillon (ed), *Management of Aquifer Recharge for Sustainability*. A.A. Balkema Publishers, The Netherlands.

## **Charles Parsons Initiative On Energy & Sustainable Environment**

### **Selected Publications**

#### ***Refereed Conference papers '02***

Toal D.J.F., Lewis E., Flanagan C., Nolan S., Gawley A.N., Lyons W., "Approaches to optical fibre based proximity sensing for autonomous underwater vehicles", Proc. 3 Wismarer Automatisierungssymposium, pp 2.2-3, Sept 2002, Wismar.

Toal D., Flanagan C., Molnar L., Nolan S., Love T., "Reactive control in the design of an autonomous underwater vehicle". In Intelligent Engineering Systems through Artificial Neural Networks, 2002, Vol 12, pp 527-535, ASME Press, Proc ANNIE 2002, St Louis. ISBN 0-7918-0191-8.

Arrabales R., Flanagan C., Toal D., "An adaptive video event mining system for an autonomous underwater vehicle" In: Intelligent Engineering Systems through Artificial Neural Networks, 2002, Vol 12, pp 585-591, ASME Press, Proc ANNIE 2002, St Louis. ISBN 0-7918-0191-8.

Molnar L., Toal D., and Flanagan C. (2002a). Evolving The Control Architecture For An Autonomous Underwater Vehicle. Proceedings of ISR 2002, The 33rd International Symposium on Robotics, Stockholm, Sweden.

Molnar L., Love T., Toal D., Flanagan C., "Control architecture extension for an autonomous underwater vehicle employing a subsumption approach." A&QT-R 2002 (THETA 13), IEEE-TTTC - International Conference on Automation, Quality and Testing, Robotics, pp 41-46, May 2002, Cluj-Napoca, Romania, ISBN: 973-9357-11-1.

Molnar L., Toal D. & Flanagan C., "Autonomous underwater vehicle development employing a subsumption architecture (Teaching a land based robot to swim)." 8th Mechatronics Forum International Conference, June 2002, Twente, Netherlands.

Nolan S., Toal D. & Flanagan C., "Evolving miniature robots for the underwater environment." 8th Mechatronics Forum International Conference, June 2002, Twente, Netherlands.

#### ***Keynote & Invited Lectures '02***

#### ***Patents '02***

#### ***Other '02***

## Charles Parsons Initiative On Energy & Sustainable Environment

### Selected Publications

## PUBLICATIONS 2001

### *Refereed Journals '01*

Aslibekian, O. and Moles, R. 2001 'An investigation of environmental contamination at the Silvermines abandoned mines site in Ireland, based on the preliminary delimitation of pollution hot spots.' *Mine Water and the Environment*, 20, 73-80.

M.H.B. Hayes and C.E. Clapp. 2001. Humic substances: Considerations of compositions, aspects of structure, and environmental influences. *Soil Sci.* 166, 723-737.

K.B. McTiernan, S.C. Jarvis, D. Scholefield, and M.H.B. Hayes, 2001. Dissolved organic carbon losses from grazed grasslands under different management regimes *Water Research* 35, 2565-2569

O'Regan, B. and Moles, R. 2001 'Modelling to learn – a case study in international mineral investment.' *Corporate Environmental Strategy*, 8 (4), 373-382.

O'Regan, B. and Moles, R. 2001 'Modelling the effect of information feedback on the spread of the Ebola virus.' *Environmental Management and Health*, 12 (4), 415-427.

O'Regan, B. and Moles, R. 2001 'An insight into the system dynamics method: a case study in the dynamics of international minerals investment.' *Environmental Modelling and Software*, 16 (4), 339-350.

O'Regan, B. and Moles, R. 2001 'A system dynamics model of mining industry investment decisions within the context of environmental policy'. *Journal of Environmental Planning and Management*, 44 (2), 245-262.

A.J. Simpson, J. Burdon, C.L. Graham, M.H.B. Hayes, N. Spencer, and W.L. Kingery. 2001. Interpretation of heteronuclear and multidimensional NMR spectroscopy of humic substances. *European J. Soil Science* 52, 495-509.

### *Books & Chapters In Books '01*

C.E. Clapp, M.H.B. Hayes, N. Senesi, P. Bloom, and P.M. Jardine (eds). 2001. *Humic Substances and Chemical Contaminants*. Soil Science Society of America, Inc, Madison, Wisconsin.

C.E. Clapp, M.H.B. Hayes, and U. Mingelgrin. 2001. Measurements of sorption - desorption and isotherm analyses. In C.E. Clapp, M.H.B. Hayes, N. Senesi, P. Bloom, and P.M. Jardine (eds), *Humic Substances and Chemical Contaminants*. Soil Science Society of America, Inc, Madison, Wisconsin. pp. 205-240.

C.E., Clapp, Y. Chen, M.H.B. Hayes, and H.H. Cheng. 2001. Plant growth promoting activity of humic substances. In R.S. Swift and K.M. Spark (eds). *Understanding and managing Organic Matter in Soils, Sediments and Waters*. 2001 IHSS, pp. 243-255.

M.H.B. Hayes and R.L. Malcolm. 2001. Structures of humic substances. In C.E. Clapp, M.H.B. Hayes, N. Senesi, P. Bloom, and P.M. Jardine (eds), *Humic Substances and Chemical Contaminants*. Soil Science Society of America, Inc, Madison, Wisconsin. Pp. 3-40.

## **Charles Parsons Initiative On Energy & Sustainable Environment**

### **Selected Publications**

M.H.B. Hayes and R. S. Swift. 2001. Progress towards understanding aspects of composition and structure in the humic sciences. In R.S. Swift and K.M. Spark (eds). Understanding and managing Organic Matter in Soils, Sediments and Waters. 2001 IHSS, pp. 3-16..

W.L. Kingery, A.J. Simpson, and M.H.B. Hayes. 2001. Chemical structures of soil organic matter and their interactions with heavy metals. In H.M. Selim and D.L. Sparks (eds), Heavy Metals Release in Soils. CRC Press, Boca Raton, FL. pp. . 237-243.

### ***Refereed Conference papers '01***

Hanrahan, G., Toal, D., Flanagan, C., "Autonomous submersible robots", In: Manufacturing, Modelling, Management and Control, Proceedings of the IFAC Symposium, Rio, Greece, 12-14 July 2000, Eds. P.P. Groumpos & A.P. Tzes, Elsevier 2001, pp 383-386, ISBN 0-08-043554-8.

Leyden, M., Flanagan, C., Toal, D., Pitfalls of simulation for mobile robot controller development, In: Manufacturing, Modelling, Management and Control, Proceedings of the IFAC Symposium, Rio, Greece, 12-14 July 2000, Eds. P.P. Groumpos & A.P. Tzes, Elsevier 2001, pp 377-382, ISBN 0-08-043554-8.

Toal D., Flanagan C., Molnar L., Hanrahan G. "Autonomous submersible development for underwater filming employing adaptive artificial intelligence." Sensors and Their Applications XI, September 2001, London. pp 163-168. ISBN 0-7503-0821-4.

Flanagan C., Toal D., Leyden M. and Coffey T. "Fuzzy logic for command arbitration in navigation system for a mobile robot." 16th International Conference on Production Research, 29 July/August 2001, Prague.

Toal D.J.F., Flanagan C. and Coffey T.. "Simulation in the development of mobile robot controllers, tread warily." Invited Paper. The 5th World Multi-Conference on Systemics, Cybernetics and Informatics, SCI 2001, July, 2001, Orlando, Florida, USA. ISBN 980-07-7552-2.

### ***Keynote & Invited Lectures '01***

### ***Patents '01***

### ***Other '01***

## **PUBLICATIONS 2000**

### ***Refereed Journals '00***

Kelly, R. and Moles, R. 'Towards sustainable development in the Mid-West region of Ireland'.  
Environmental Management and Health 11 (5), 422-432.

W.L. Kingery, A.J. Simpson, M.H.B. Hayes, M.A. Locke, and R.P. Hicks. 2000. The application of multidimensional NMR to the study of soil humic substances. Soil Science 165, 483-494

Moles, R. and Kelly, R. 'Using the concept of sustainability in regional management in Ireland'.  
Environmental Practice, 2 (3), 227-229.

### ***Books & Chapters In Books '00***

M.H.B. Hayes and C.L. Graham, 2000. Procedures for the isolation and fractionation of humic substances. In G. Davies and E.A. Ghabbour (eds), Humic Substances. Versatile Components of Plants, Soils and Waters. The Royal Society of Chemistry, Cambridge. pp. 91-109.

### ***Refereed Conference papers '00***

C.E. Clapp and M.H.B. Hayes. 2000. Advances in procedures for the isolation and fractionation of humic substances. Proc. 10th International Meeting of the International Humic Substances Society (Toulouse, France) 2, 1251-1252.

Leyden, M., Toal, D., Flanagan, C. "An autonomous mobile robot built to develop and test behaviour based control strategies," Mechatronics 2000, Atlanta.

A.J. Olness, C.E. Clapp, and M.H.B. Hayes. 2000. Application of a general energy model for limited systems to adsorption. Proc. 10th International Meeting of the International Humic Substances Society (Toulouse, France) 1, 431-432.

A.J. Simpson, W.L. Kingery, M.A. Locke, M.H.B. Hayes, and M. Spraul. 2000. Determination of humic molecular structure and interactions with a herbicide by multidimensional NMR. . Proceedings of the 41st Experimental Nuclear Magnetic Resonance Conference, Pacific Grove, CA. p. 242.

A.J. Simpson, W.J. Kingery, M.H.B. Hayes, M. Spraul, E. Humpfer, P. Dvortsak, R. Kerssebaum, M. Godejohann, and M. Hofmann. 2000. The structure and associations of organic molecules in the terrestrial environment. Proc. 10th International Meeting of the International Humic Substances Society (Toulouse, France) 2, 1109-1112.

### ***Keynote & Invited Lectures '00***



## Charles Parsons Initiative On Energy & Sustainable Environment

### Selected Publications

#### ***Patents '00***

#### ***Other '00***

Moles, R. and Limerick City Development Board Strategy for economic, social and cultural development 2002-2012, 2000 .

Moles, R., Kelly, R., O'Regan, B., Ravetz, J. and McEvoy, D. Methodologies for the estimation of sustainable settlement size. Environmental RTDI Programme 2000-2006, 2000-LS-4.3-M1. Environmental Protection Agency, Co Wexford, Ireland. Summary report from EPA Publications, Dublin. Full report at <http://www.epa.ie/r-d/default.htm>, 2000