Professor Clive Roberts BEng, PhD, MIET

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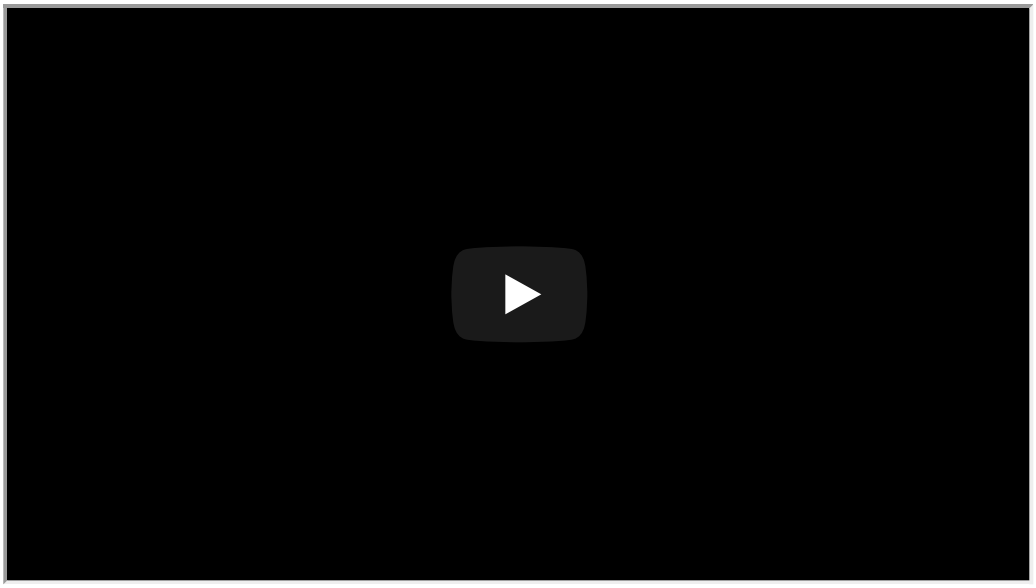
Clive is Professor of Railway Systems at the University of Birmingham and Director of the Birmingham Centre for Railway Research and Education. Over the last 14 years he has developed a broad portfolio of research aimed at improving the performance of railway systems. He leads the University's contribution in a number of large EPSRC, European Commission and industry funded projects. He works extensively with the railway industry in Britain and overseas. He currently leads a team of 11 research fellows and 16 PhD students.



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Qualifications

- PhD in Electronic and Electrical Engineering (University of Birmingham)
- BEng (Hons) in Electronics (University of Wales, Cardiff)
- MIET

Biography

Clive graduated from the University of Wales, Cardiff with a BEng (Hons) in Electronics in 1996. He then went on to work at Lucas Aerospace in Birmingham as a Software Engineer for just over a year.
In 1997 he joined the University of Birmingham as a Research Fellow and began working on projects looking at railway condition monitoring of railway infrastructure assets.
In 2001 he became a Lecturer. In 2007 he was promoted to the role of Senior Research Fellow and took on the role of Director of Research for the Birmingham Centre for Railway Research and Education. In 2010 he became Professor of Railway Systems.

Teaching

Teaching Programmes
- Year 1 - Student Induction.

• Year 2 - Project Management and Professional Practice
• Year 2 - Electrical Power
• MSc - Railway Systems Engineering for Dependability
• MSc - Small Embedded Systems

Postgraduate supervision

Clive currently supervises a group of 16 PhD students. Most years scholarships are available to able students who have a genuine interest in the area of railway research. Please see Clive's personal web pages www.eee.bham.ac.uk/robertc for further information.

Research

RESEARCH THEMES
Clive's research interests lie in the areas of: systems engineering; system modelling and simulation; traffic management; fault detection and diagnosis; and data collection and decision support, applied to railway traction, signalling, mechanical interactions and capacity.

RESEARCH ACTIVITY
Current research projects include:
• EC FP7 - Development of Novel Inspection Systems for Railway Wheel-sets (SAFERAIL) www.saferail.net (2008-2011)

• Department for Transport – Railway Capability Trade-offs (2009-2011)

• EC FP7 - High-Speed Inspection of Railway Track Systems (INTERAIL) www.interailproject.eu (2009-2012)

• EC FP7 - Novel Integrated Condition Monitoring (NIMO) for Wind Turbines www.nimoproject.eu (2009-2012)

• AWM - Hybrid Transport System Integration Laboratory www.birminghamsciencecity.co.uk (2009-2014)

• Singapore Land Transit Authority - Single Train Simulator Development (2010-2011)

• Network Rail - Switch locking mechanism analysis (2010-2011)

• EPSRC - Development and deployment of decision support algorithms for railway systems (2010-2011)

• EPSRC - Railway Track for the 21st Century (Track21) www.track21.org.uk

• EPSRC CASE - Development of a semantic data model to support data interoperability in the railway industry (2010-2014)

• EPSRC CASE - Simulation and testing of railway traffic management and train control algorithms (2010-2014)

• Southern Railway - Conductor shoe monitoring (2010-2011)

• National Nature Science Foundation of China - Energy usage optimisation for railway operations (2010-2011)

• EPSRC - Factor 20 Feasibility Study (2011)

• Ascent Dynamics (Hong Kong) – Multi-train simulation for power system dimensioning for Kuala Lumpur Metro (2011)

• Network Rail – Support for intelligent infrastructure (2011-2013)

• EC FP7 - Augmented Usage of Track by Optimisation of Maintenance, Allocation and Inspection of Railway Networks (AUTOMAIN) www.automain.eu (2011-2014)

• EC FP7 - Optimal networks for train integration management across Europe (ON-TIME) (2011-2014)

Publications

• Journal Article - Roberts, C., Goodman, C.J., Dassanayake, H.P., Lehrasab, N. (2002). Distributed quantitative and qualitative fault diagnosis: Railway junction case study, Control Engineering Practice, 10(4): 419-429.

• Journal Article - Takagi, R., Goodman, C.J., Roberts, C. (2003). Modelling passenger flows at a transport interchange using Petri Nets, Proceedings of the IMechE: Part F – Journal of Rail and Rapid Transit, 217(2): 125-134.

• Journal Article - Weston, P., Ling, C.S., Roberts, C., Goodman, C.J., Li, P., Goodall, R.M. (2007). Monitoring vertical track irregularity from in-service railway vehicles, Proceedings of the IMechE: Part F – Journal of Rail and Rapid Transit, 221(1): 75-88.

• Journal Article - Weston, P., Ling, C.S., Goodman, C.J., Roberts, C., Li, P., Goodall, R.M. (2007). Monitoring lateral track irregularity from in-service railway vehicles, Proceedings of the IMechE: Part F – Journal of Rail and Rapid Transit, 221(1), 89-100.

• Journal Article - Hillmansen, S., Roberts, C. (2007). Requirements for energy storage devices in hybrid railway vehicles: a kinematic analysis, Proceedings of the IMechE: Part F – Journal of Rail and Rapid Transit, 221(1): 135-143.

• Journal Article - Bocharnikov, Y., Tobias, A., Roberts, C., Hillmansen, S., Goodman, C.J. (2007). Optimal driving strategy for traction energy saving on DC suburban railways, IET Research Journal: Electric Power Applications, 1(5): 675-682.

• Journal Article - Chen, J., Roberts, C., Weston, P. (2008). Fault diagnosis for railway track circuits using neuro-fuzzy systems, Control Engineering Practice, 16(5): 585-596.

• Journal Article - Garcia, F., Lewis, R., Tobias, A., Roberts, C. (2008). Life cycle costs for railway condition monitoring, Transportation Research Part E: Logistics and Transportation Review, 44(6): 1175-1187.

• Journal Article - Papaelias, M., Roberts, C., Davis, C. (2008). A review on non-destructive evaluation of rails: State-of-the-art and future development, Proceedings of the IMechE: Part F – Journal of Rail and Rapid Transit, 222(4): 367-384.

• Journal Article - Papaelias, M., Lugg, M., Roberts, C., Davis, C. (2009). High-speed inspection of rails using ACFM techniques, NDT&E International, 42, 328-335.

• Journal Article - Lewis, R., Roberts, C. (2010). Using non-monotonic reasoning to manage uncertainty in railway asset diagnostics, Expert Systems with Applications, 37(5): 3616-3623.

• Journal Article - Silmon, J., Roberts, C. (2010). Using functional analysis to determine the required performance: railway level crossings safety equipment case study, Reliability

Engineering and System Safety, 95(3): 216-225.

• Journal Article - Meegahawatte, D., Hillmansen, S., Roberts, C., Falco, M., McGordon, A., Jennings, P. (2010). Analysis of a fuel cell hybrid commuter railway vehicle, Journal of Power Sources, 195, 7829-7837.

• Journal Article - Silmon, J., Roberts, C. (2010). Improving switch reliability with innovative condition monitoring techniques, Proceedings of the IMechE: Part F – Journal of Rail and Rapid Transit, 224(4): 293-302.

• Journal Article - Chen, L., Schmid, F., Dasigi, M., Ning, B., Roberts, C., Tang, T. (2010). Real-time train rescheduling in junction areas, Proceedings of the IMechE: Part F – Journal of Rail and Rapid Transit, 224(6): 547-557.

• Journal Article - Stewart, E., Weston, P., Hillmansen, S., Roberts, C., (2011). Using bogie-mounted sensors to understand the dynamics of 3rd rail current collection systems, Proceedings of the IMechE: Part F – Journal of Rail and Rapid Transit, 225(2), 219-227.

• Journal Article - Lu, S., Hillmansen, S., Roberts, C. (2011). A power management strategy for multiple unit railroad vehicles, IEEE Transactions on Vehicular Technology, 60(2), 406-420.

• Journal Article - Easton, J., Davies, J., Roberts, C. (2011). Ontology engineering: The “What’s”, “Why’s”, and “How’s” of data exchange, International Journal of Decision Support System Technology, 3(1), 40-53.

• Government Report – Hillmansen, S., Roberts, C., McGordon, A., Jennings, P. (2008). Calculation of Energy Consumption of Hybrid High Speed Trains, published by the University of Birmingham for the Department for Transport.

• Government Report – Hillmansen, S., Roberts, C., McGordon, A., Jennings, P. (2008). Calculation of Energy Consumption of Commuter Trains, published by the University of Birmingham for the Department for Transport.

• Roberts, C., Schmid, F., Connor, P., Ramdas, V., Sharpe, J. (2010). A New Railway System Capacity Model, published by Transport Research Laboratory (TRL) for the Department for Transport.

Related Schools

- Department of Electronic, Electrical and Systems Engineering
- School of Engineering

Related Research

- The Energy Systems Integration Laboratory
- Birmingham Centre for Railway Research and Education
- Material Systems for Extreme Environments (XMat)
- Electronic, Electrical and Systems Engineering Research

Related News and Events

- International rail conference speeds into Birmingham
- Parliamentary Under Secretary of State at the Department for Business, Energy and Industrial Strategy visits University to learn more about innovative industrial research and education
- University of Birmingham launches new railway research institute in China
- University to play key role in training of HS2 engineers
- Birmingham Centre for Railway Research and Education - Connecting with research prizes