IfM Distributed Information and Automation Laboratory

UNIVERSITY OF CAMBRIDGE

DIAL Quarterly: Featuring science fiction into fact, meet the team & more

Welcome from Professor Duncan McFarlane

Welcome to the first DIAL Quarterly. This newsletter aims to update on research activities here at Cambridge as well as providing practical information on events, developments and products that impact on industrial automation and control. DIAL is one of eight research centres in the Institute for Manufacturing (IfM) at the University of Cambridge. A major focus of the Institute is to bridge the gap between academic research development and industrial practice, and DIAL provides this support for the industrial information and automation community.
In particular, DIAL focuses on effective information management and control solutions for complex operations subject to frequent disruption or long-term systemic change. The lab has developed a suite of approaches for both analysing and improving operations whose physical performance is apparently at odds with that predicted by its information management system.
Our research in this area spans the entire supply chain from production through distribution and retail to services and maintenance and finally automation. Enduring themes include information valuing, managing uncertainty, and assessing and improving reconfigurability to future proof industrial systems. We look forward to keeping you up to date and meeting you at our events.

Turning science fiction into science fact

Hi-tech firm Google hit the headlines recently for its work on creating cars with the ability to drive themselves.
Now imagine if the cars were also intelligent enough to perform their own maintenance. This may sound like science

£17m IKC announced

DIAL have been successful in partnership with the civil engineering division in winning a 5 year project to develop an Innovation and Knowledge Centre (IKC) in Smart Infrastructure and Construction. The total value of the project is £17 million. More details are available here

Upcoming events

Tuesday November 9th 2010
4th International Workshop on Asset Management
The workshop brings together people from leading asset management organisations and leading academic researchers to disseminate the latest developments in asset management research and practice. The workshop will include presentations from industry and academic speakers as well as interactive discussion and poster sessions to promote and establish the need for research in this area.

In addition to researchers from the University of Cambridge, the confirmed speakers so far include:
* Professor Andy Koronios, University of South Australia
* Professor Rajkumar Roy, Cranfield University
* Professor Mohsen Jafari, Rutgers University
* John Woodhouse, The Woodhouse Partnership Ltd.
* Jacqueline Harrison, National Grid
* Julian Schwarzenbach,

fiction, but it forms the
basis for a research project at DIAL called Self-serving Assets in a Highly Networked Environment (SAHNE) sponsored by the Boeing Corporation. DIAL is carrying out research which could see aircraft organising their own maintenance schedule, see individual components ordering replacement parts and could even reduce the environmental impact of air travel. The project uses technologies such as Radio Frequency Identification (RFID) and software agents to make aircraft parts self aware.
The tiny chips can invest any component with limited artificial intelligence. They carry data which when read can provide information on the age of the part, materials and service intervals. Combined with a computer system using the latest mathematical and organisational methodologies, individual components and high-value assets can essentially contact, select and order necessary action autonomously. The project team is currently developing a demonstrator model to show the self-serving asset in operation. It is hoped additional functionality will eventually include competition management which will help the assets secure best pricing for replacement parts, the sharing of data on reliability of suppliers and post-service monitoring. Preliminary tests have produced some promising results but the research is still at an early stage. Researchers are now beginning to consider future challenges such as the cultural acceptance of smart components, the likely regulatory hurdles and the development of robust infrastructure to make it a commercial reality. To find out more about the project click here

Meet the team: Dr Ajith Parlikad

Ajith joined the IfM to read for his PhD, which he successfully completed in August 2006. His PhD research developed a methodology for quantifying the benefits of improving product information availability and quality on the effectiveness of product recovery processes. He has also been involved in consulting to logistics companies on RFID.
Ajith currently leads research activities on asset management and maintenance at the Institute, with a specific focus on examining how asset information can effectively be managed and used to improve asset investment and maintenance decision-making. He currently runs two research projects - one funded by the IMRC on information management strategies, and the other funded by the EPSRC on information quality in asset-intensive organisations - in addition to a number of student projects in this area.
For more details about Ajith, including his current list of publications click here

Recent Publications

RFID opportunity analysis for leaner manufacturing by Alexandra Brintrup, Damith Ranasinghe and Duncan McFarlane.
RFID is seen by many as a revolutionary enabler of automated data capture, confusion still remains as to how manufacturing organisations can identify cost-effective opportunities for its use.The paper looks at how RFID could be used to achieve leaner manufacturing through automated data collection.

Semi Markov Decision Process with Partial

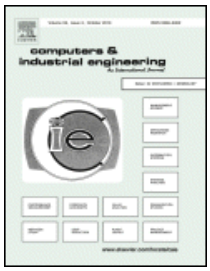
Data and Process Advantage Ltd.

The workshop aims to address the following issues:

* How can we maximise the whole life value of asset ownership?
* How can we reduce whole life costs without compromising factors such as safety and availability?
* How can we ensure data quality is suitable for decision making?
* What is the impact of information systems on asset performance?
Speakers
The event is by invitation only but if you would like to register your interest in attending please contact Dr Ajith Parlikad as soon as possible on aknp2@eng.cam.ac.uk

DIAL seminars
The next DIAL seminar is due to take place on Thursday November 25th at the IfM. The seminar will be given by Paul Gibbons, Asset Manager& Research Engineer for Gatwick Airport Limited.
Full details will be available shortly on the IfM calendar or at talks.cam
For a full list of DIAL and other IfM events please click here

Information for Maintenance Decisions by Rengarajan Srinivasan and Ajith Parlikad.Using a Partially Observable Semi Markov Decision Process for optimising maintenance decisions.



Quantifying the impact of AIDC technologies for vehicle component recovery by Ajith Parlikad and Duncan McFarlane. This paper illustrates how decision-making during product recovery can be improved through the use of RFID and AIDC technologies to collect critical usage data during a vehicle's lifecycle and making it readily available to key decision-makers.

Value of information in product recovery decisions: a Bayesian approach by Ajith Parlikad and Duncan McFarlane
This paper examines the value of information during product recovery. It illustrates a new approach for quantifying the impact of product information availability on the effectiveness of product recovery decisions.

If you are interested in anything that has been featured in the newsletter or would like further information about DIAL, then please do not hesitate to contact us on DIAL-admin@eng.cam.ac.uk or call the DIAL administrator Sarah Brown on +44 (0)1223 764306.

To subscribe you or a colleague to the DIAL quarterly newsletter, please visit www.ifm.eng.cam.ac.uk/newzapp.html

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