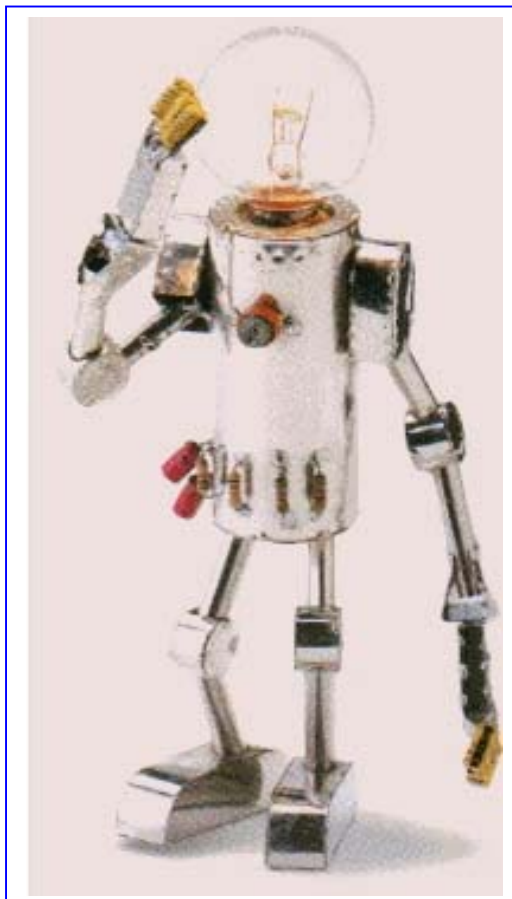


RoboFesta UK



Promoting science and technology in Britain
through robot events and competitions,
education, and teamwork

 RoboFesta-UK is sponsored by the Open University

RoboFesta News #2

May 2002

edited by

Anthony Hirst and Jeffrey Johnson

Faculty of Technology, The Open University

www.robofesta-uk.org

RoboFesta-UK Diary Dates

Please note that the following events are not necessarily associated with RoboFesta-UK in any formal way.

- Event:* Living Robots Show (robot predator-prey/ecological robots demonstration)
Venue: Magna, Rotherham
Contact: www.magnatrust.co.uk
- Event:* Mums and kids robot building workshop
Venue: Kelham Island Industrial, Museum at Sheffield
Contact: Noel Sharkey (nsharkey@magnatrust.co.uk)
- Event:* Public Lecture, Prof. Rodney A. Brooks, Director, MIT AI Lab.
Date: Tuesday May 14th, 18:30
Venue: Chichester Lecture Theatre, University of Sussex
- Event:* Space and Planetary Robotics Network Inaugural Meeting
Date: Friday 17 May 10:00 – 17:00
Venue: Berrill Lecture Theatre, The Open University, Milton Keynes
Contact: Rodney Buckland (r.buckland@open.ac.uk)
- Event:* Frontiers of Science and Technology.
Date: Saturday 18 May 2002
Venue: The Science Museum, Exhibition Road, London, SW7 2DD
- Event:* Cheltenham Festival of Science Robot Arena
Date: 22-26 May
Contact: Noel Sharkey (nsharkey@magnatrust.co.uk)
- Event:* Family Robot Day
Date: Wednesday 5 June
Venue: Blackbird Leys Leisure Centre, Oxford
Organiser: Alan Vincent (alan@mobstem.org.uk) SETPOINT for Milton Keynes, Oxfordshire & Buckinghamshire
Details: Hands-on family day for kids and parents.
- Event:* RoboFesta-MK RoboCup Junior finals
Date: Wednesday 12 June
Venue: Berrill Lecture Theatre, The Open University, Milton Keynes
Organiser: RoboFesta-MK/Mobstem/Countec (robofesta@open.ac.uk)
- Event:* Shropshire Lunar Rover Competition finals, West Midlands Show, Shrewsbury
Date: 21st-22nd June
Contact: Ashley Green, aagree@brookes.ac.uk
- Event:* Family Robot Days
Date: Saturday/Sunday, June 28th-29th
Venue: INSPIRE Science Centre, Norwich
Organiser: James Piercy (james@science-project.org)
Details: Hands-on family days for kids and parents.

Event: Residential robotics week, Oxford Brookes University
Date: 15th-19th July
Contact: Mohammed Ansar, wideningparticipation@brookes.ac.uk

Event: British Interactive Group Conference (BIG Event 2002)
Date: 24th-27th July
Venue: The Observatory Science Centre, Herstmonceux, Sussex
Contact: <http://www.big.uk.com/events/index.htm>

Event: Research Workshop on Robotics as Theoretical Biology
Date: August 10th 2002, Edinburgh
Venue: Part of SAB02 (<http://www.isab.org.uk/sab02/>)
Contact: <http://www.shef.ac.uk/~abrg/sab02/index.shtml>

Event: Robotics Holiday for Children
Date: 15th - 25th August
Venue: Langton Hall in North Yorkshire
Contact: Ian Johnston (i.johnston@open.ac.uk)

Contents

0. Diary Dates
1. Introduction
2. Review of Recent Events
3. The RoboFesta-UK Network
4. The Blue Peter/RoboFesta Robot Design Database
5. Ongoing/Forthcoming Events
6. Items for next newsletter

1. Introduction

1.1 Welcome

Welcome to this second RoboFesta-UK newsletter. There were several very successful robotics related events held during Science Week and we have reviews of many of them. The two Mars Rover events in South Wales and Oxfordshire showed that this is a very exciting scenario for many, combining as it does notions of robotics with space exploration. As Dr Ashley Green from Oxford Brookes University is keen to point out, there are several high profile space missions due to hit the news over the next eighteen months and it is important that we make the most of the widespread public interest that will undoubtedly be generated. The INSPIRE Science Centre family robot day proved to be very popular and rounded off a week in which several local schools attended the centre for a robotics workshop. The Southern Science and Technology Forum have also been busy taking a robotics related activity day into schools in Hampshire and Dorset. The predator-prey robot arena show at Magna was also opened and looks set to attract large numbers of visitors.

It is encouraging to see that a wide variety of robotics related events are taking place over the next few months and details of these provided where we have them. In particular, the Cheltenham Festival of Science (22-26th May) looks well worth a visit, as do the Family Robot Days in Oxford (5th June) and Norwich (June 29th, 30th).

1.2 Robotics challenges.

Robotics challenges are also increasing in popularity throughout the world. Many of the events reviewed in this newsletter take the form of challenges, for several reasons. Firstly, participants have a very definite goal and hence reason for building/programming a particular robot. Secondly, the need to improve on a design is encouraged by the desire to improve the robot's performance with respect to the challenge. Thirdly, friendly competition between groups of students can foster team building. Fourthly, everyone's a winner insofar as their robot can complete a particular challenge.

Although we are not going to focus on any particular robotics challenges in this issue of the newsletter, or the philosophy behind them and reasons why they do have a useful role to play in both formal (school) and informal (educational leisure, family learning) education, we will consider this in a future issue of the newsletter; for example, RoboCup Junior football and dance competitions (and the related RoboSoccer challenge) will be covered in the next newsletter. In the meantime, the following organisations give a good introduction to some of the robotics challenges on offer.

The Canadian Robotics Challenge (<http://challenge.enoreo.on.ca/>) aims to "provide opportunities to learn about science, technology, math and design through the development, programming and testing of autonomous robotic devices". This cross-curriculum approach mirrors the approach we would like to take in developing robotics activities to support all Key Stages. Several challenges are described on the Robotics Challenge website, so if you have some robotics kit, and you're looking for tried and tested projects to use it with, this site is well worth a visit.

The RoboCup Junior football, dance and rescue competitions (<http://www.artificialia.com/RoboCupJr/>) are growing as international competitions, often co-located with major academic conferences and major sporting events. For example, this year's competition will take place in Japan to coincide with the football world cup. We will review children's robot football in the next issue of the newsletter, and take a look at the RoboSoccer package which can get you up and running from scratch with a robot football match in under a couple of hours.

Thirdly, the First Lego League (<http://www.firstlegoleague.org>), co-promoted in the UK by Lego and the Young Technologists uses Lego Mindstorms based challenges to promote teamwork and friendly

competition. Technical details aside, there is a considerable emphasis on aspects of the design process (such as brainstorming ideas) and on team-building. The Team Resources material is well worth a look.

1.3 Growing the RoboFesta-UK Network

If you would like more details of any of the events (past or forthcoming), please get in touch with the organisers directly. If you have details of other relevant events, please pass them on to us (robofesta@open.ac.uk) and we will publicise them as best we can.

We hope to visit some of the forthcoming events, as well as participating in some of them, so please feel free to corner us with your thoughts about how to take RoboFesta-UK forward. We also look forward to hearing of many more robotics related initiatives from you.

1.4 Acknowledgements

Thanks to everyone who provided information for this newsletter.

2. Recent Events

The following events have all taken place 'independently' of RoboFesta-UK. We are still working out the best way forward for labelling events as 'RoboFesta-UK'.

Event: Mars or Bust
Venue: Pontypridd Museum
Organiser: Mike Reddy (mreddy@glam.ac.uk)
Review: With 30 children a day attending this event over a 5 week period, the Mars or Bust Challenge (duration 5 hours) has been one of the most intensive and extensive robotics related university outreach activities we've come across to date. Details of the event are posted at <http://www.comp.glam.ac.uk/staff/mreddy/mars-or-bust/>. The participants used ibook laptops with track pads. Programming was done using Robolab - the educational programming language for Lego Mindstorms. Mike reported that the participants 'coped rather well after some initial problems with multiple fingers on the track pads!' After a surprisingly short time, students were making very focussed tests of their robots resulting in quite sophisticated programs tailored to their own creations.

Event: Family Robot Day (Saturday, 16th March)
Venue: INSPIRE Science Centre, Norwich
Organiser: James Piercy (james@science-project.org)
Review: The family robot day filled the Centre (860 visitors over the day) with a wide variety of robot related demonstrations and exhibits among the standing exhibits. There was a standard admission charge. The Robot Wars teams (Storm - www.stormrobot.com, Thermidor - www.teamlobster.freeserve.co.uk/, Tornado - www.teamtornado.co.uk/) proved to be the major attraction, along with a rope climbing Technogames robot. As these teams develop their educational mission (robotics, mechanics and engineering) they are very well placed to both attract and inform large numbers of visitors to special day events such as this. A hands-on exhibit gave individual family groups a 5-10 minute opportunity to program a prebuilt Lego Mindstorms wheeled robot. Its behaviour could then be observed in a small, closed arena. Two standalone PCs were available, running Robolab (Pilot 3, Bumper Car 1) and controlled via a mouse (no keyboard present). A single demonstrator was on-hand to help. Attendance at the event was mainly family groups with significant mid-morning and early afternoon crowds.

In the week running up to the Family Day, local primary schools attended the Centre for a short hands-on robot programming experience similar to that used on the Family Day itself.

The event will be run again over the weekend of June 29th and 30th.

Event: Technology Day
Venue: Northwood House, Newport IW
Organiser: Southern Science & Technology Forum (sstf@soton.ac.uk)
Review: A day long event for local schoolchildren aged 12-15, comprising 4 separate activities. The robotics activity lasted approximately 90 minutes and hosted seven groups of 5 students

each session. Each group was provided with a Lego RCX brick, 2 motors and a selection of Lego Technic components. The challenge was to design, build, decorate and program a robot capable of moving round the room and, if time allowed, detecting collisions and taking an appropriate action (touch sensors for the bumper were available). Three laptops with track pads and running RoboLab Inventor were available. Each group was given a 5 minute orientation with the software.

Event: Technology Day

Venue: Ashdown School, Poole

Organiser: Southern Science & Technology Forum (sstf@soton.ac.uk)

Review: Two, day long events, each for half of the year 10 cohort. Each day was split into 3 sessions. Students were placed into mixed gender, mixed ability groups of four at the start of the day, and remained in the same group throughout. Ideally scheduled, the first session required groups to build a geared, solar powered vehicle using K'Nex. The second session was to construct a battery powered vehicle using a Technogames kit. The third session was to build and program a simple robot using the Lego RCX brick and the RoboLab programming environment. Each group was ranked in each session. The best performing group for each activity was awarded a prize.

Event: Lunar Rover

Venue: Oxford Brookes University

Organiser: Ashley Green (aagreen@brookes.ac.uk)

Review: Two day long LEGO Mindstorms "Lunar Rover!" competitions, one for Primary Years 6 and 7 pupils on Tuesday 19 March, and the other for Secondary Year 12 pupils on Wednesday 20 March. The school teams arrived for 10.00 a.m., and received a short briefing, before constructing and testing their lunar rovers from about 10.30 a.m. until 1.00 p.m. The groups of 5 then competed against each other to remotely control their rovers over the simulated lunar terrain (i.e. the floor strewn with rocks and a few papier-mache hills and craters), trying to identify as many different types of rocks as possible using the images from the wireless video cameras incorporated in their rovers. Teams were judged on the design and performance of their rovers and their success at identifying all the different types of rocks in the terrain. First, second and third prizes were awarded at about 2.00 p.m, for a 2.30pm departure. This event is one of a range of events organised by and on behalf of the Oxford Brookes Widening Participation Unit (wideningparticipation@brookes.ac.uk).

Event: RoboSoccer Launch, Thursday 24th April

Venue: Pompey Study Centre, Portsmouth FC

Organiser: Mark Scarborough (markscarborough@pompeystudycentre.org.uk)

Review: RoboSoccer is a version of robot football played according to RoboCup Junior one-on-one football rules and currently marketed by Commotion Group (www.commotiongroup.co.uk). The ~A0 pitch has a gray scale gradient (so the robots can tell the direction they are going in from a downward looking light sensor) and the ball is packed with infra-red emitting diodes which can be seen by forward looking light sensors. A pitch surround keeps the pitch enclosed. Six teams of four, year 8 mixed gender, mixed ability pupils each programmed a pre-built robot football player with the Interactive Robot Football package developed by Henrik Lund and Luigi Pagliarini. Each team played each other team in a league competition, on one of three pitches. During half-time of each match teams could make a rapid program change (to cope with changing ends on the pitch). More substantial modifications could be made to the programs between matches. Although the robots were pre-built, each team had to decorate their robot using materials provided. Each team also had to produce a Powerpoint presentation about their team and their robot. Prizes were awarded to the team with the best presentation and also to the team who won the league competition. A helper was on hand for each team, but many of the teams felt that they could have managed with a software briefing session and one or two roaming helpers.

RoboSoccer offers great potential, and moves are afoot to establish a national league. If you would like to know more, email Mark Scarborough (markscarborough@pompeystudycentre.org.uk).

3. The RoboFesta-UK Network

3.1 Aim of the RoboFesta-UK Network

The aim of the RoboFesta-UK network is to develop a community of best practice in the field of educational and challenge robotics. Robotics cuts across discipline boundaries and can be used as a unifying theme for teaching IT, design, technology, science, maths and communication skills. Robotics activities can be pursued at an individual or group level.

Through the network, members will be able to share and develop educational robotics activities that transcend geographical and cultural boundaries. In particular, the network will develop and promote educational robotics challenges for the general public, for school use at all levels, and for widening participation in HE.

Maximising the number of outlets for educational robotics activities is a key aim. The network is open to members of formal educational outlets (universities, colleges, schools) as well as informal ones (science centers, museums, software (games/web) developers). Providing integrated educational support within the robotics activities is essential, and the network will provide a forum for developing and testing such material.

3.2 Objectives of the RoboFesta-UK Network

Create a national context for educators using robotics in formal and informal settings to teach across discipline boundaries.

Identify proven robotics related challenges capable of supporting educational outcomes for a range of settings, audiences and duration.

Identify and produce educational support materials for a variety of robotics related challenges: e.g. formal setting (e.g. classroom), informal setting (e.g. science centre, home use).

4. The Blue Peter/RoboFesta Robot Design Database.

Some of you may recall the 'Design a Robot' Competition we ran with the BBC Blue Peter television programme in February last year (http://www.robofesta-europe.org/britain/bp_index.html). In the competition, the children were given the straightforward instruction to design 'a really useful robot'.

The simple competition description implicitly required competitors to do several things. Firstly, it required the children to identify a problem. Secondly, it required them to identify a solution to the problem. Thirdly, it required them to depict a mechanical way of executing that solution. In this sense, the robot designs correspond to the children's solution to a problem they have discovered, or more specifically, presented as a representation of an artefact capable of performing a particular function, or task, by itself.

The competition attracted 32,000 A4 drawings from children across the UK in the age range 4 to 15. Over the last year, all the entries have been digitised and we will soon be in a position to make the electronic database available to researchers.

As well as containing digitised versions of the competition entries, the designs are associated with information relating to the broad demographic of the designer (age, gender, first half of the UK postcode).

If you would like to know more about this unique resource, please email robofesta@open.ac.uk.

A preliminary report on the children's designs is available as an illustrated html document from: <http://robofesta.open.ac.uk/report2/>

5. Ongoing/Forthcoming Events.

Please note that the following events are not necessarily associated with RoboFesta-UK in any formal way.

Event: Living Robots Show (robot predator-prey/ecological robots demonstration)
Venue: Magna, Rotherham
Date: Daily (7 days a week). With 7 shows per day in the holiday periods.
Contact: www.magnatrust.co.uk

Event: Mums and kids robot building workshop
Venue: Kelham Island Industrial, Museum at Sheffield
Contact: Noel Sharkey (nsharkey@magnatrust.co.uk)
Details: Training 2000 inner city kids and mums to build little autonomous robots

Event: Public Lecture, Prof. Rodney A. Brooks, Director, MIT AI Lab.
Date: Tuesday May 14th, 18:30
Venue: Chichester Lecture Theatre, University of Sussex
Details: This lecture is in association with Penguin Books who are publishing Rod's forthcoming book, 'Robots: The Future of Flesh and Machines'.

Event: Space and Planetary Robotics Network Inaugural Meeting
Date: Friday 17 May 10:00 – 17:00
Venue: Berrill Lecture Theatre, The Open University, Milton Keynes
Contact: Rodney Buckland (r.buckland@open.ac.uk)
Details: Inaugural meeting of the *Space and Planetary Robotics Network*, sponsored by the *Dept of Design and Innovation* and the *Planetary and Space Sciences Research Institute of The Open University*. Includes a talk by Dr Ashley Green on Robot Planetary Explorers: A Golden Opportunity for Educational Outreach.

Event: Frontiers of Science and Technology
Date: Saturday 18 May 2002
Venue: The Science Museum, Exhibition Road, London, SW7 2DD
Organiser: Open University in London, in association with the Science Museum, London
Details: An excellent opportunity to hear talks on current issues in Science, Technology, and Psychology in the inspiring surroundings of the Science Museum.

Event: Cheltenham Festival of Science Robot Arena
Date: 22-26 May
Contact: Noel Sharkey (nsharkey@magnatrust.co.uk)
Details: Robot arena with Robot Wars and Technogames robots.

Event: Family Robot Day
Date: Wednesday 5 June
Venue: Blackbird Leys Leisure Centre, Oxford
Organiser: Alan Vincent (alan@mobstem.org.uk) SETPOINT for Milton Keynes, Oxfordshire & Buckinghamshire
Details: Hands-on family day for kids and parents.

- Event:* RoboFesta-MK RoboCup Junior finals
Date: Wednesday 12 June
Venue: Berrill Lecture Theatre, The Open University, Milton Keynes
Organiser: RoboFesta-MK/Mobstem/Countec (robofesta@open.ac.uk)
www.robofesta-uk.org/MK2002
Details: Finals competition for local schools competing in robot football and robot dance competitions. All welcome to attend the finals and see robot football in action.
- Event:* Shropshire Lunar Rover Competition finals, West Midlands Show, Shrewsbury
Date: 21st-22nd June
Details: Featuring the finals of the Shropshire Lunar Rover Challenge that has been running in Shropshire schools. About 14 teams of 4 students each will be taking part. The competition involves the construction and programming of Mars rovers using LEGO Mindstorms kits and RoboLab software, to completely clear a circular "landing area" of rocks in the shortest possible time.
Contact: Ashley Green, aagreen@brookes.ac.uk
- Event:* Residential robotics week, Oxford Brookes University
Date: 15th-19th July
Details: A HEFCE-funded Summer School for 50 Secondary Year 11 students from social groups underrepresented in HE. We shall be running taster sessions and two-day projects involving the construction of teleoperated Mars rovers using LEGO Mindstorms kits and wireless video cameras.
Contact: Mohammed Ansar, wideningparticipation@brookes.ac.uk
- Event:* Family Robot Days
Date: Saturday/Sunday, June 28th-29th
Venue: INSPIRE Science Centre, Norwich
Organiser: James Piercy (james@science-project.org)
Details: Hands-on family days for kids and parents.
- Event:* Research Workshop on Robotics as Theoretical Biology
Date: August 10th 2002, Edinburgh
Venue: Part of SAB02 (<http://www.isab.org.uk/sab02/>)
Contact: <http://www.shef.ac.uk/~abrg/sab02/index.shtml>
Details: This workshop seeks to bring together researchers in robotics and biology who are interested in developing robot models of the biological systems underlying animal behaviour.
- Event:* Robotics Holiday for Children
Date: 15th - 25th August
Venue: Langton Hall in North Yorkshire
Contact: Ian Johnston (i.johnston@open.ac.uk), www.ate.org.uk
Details: The ATE Trust will be running a ten day residential Robotics Superweek for 10 - 13 year olds at Langton Hall in North Yorkshire from 15th - 25th August this summer. The robotics Superweek will have several interlinked themes:
1) Designing and building mechanisms. These sessions will be led by Len McDiarmid and Dick Warren of the Rude Mechanicals (www.mechanicals.co.uk) and involve the construction of a range of devices from simple drive mechanisms to siege engines and moving toys out of wood, cardboard, paper and string. It's a real chance for children to get hands-on experience under friendly guidance. Len and Dick are based in the

Scottish Borders and have a huge reputation across Scotland and the North of England for their fun approach to technology for children.

2) Robot building. At a pilot engineering Superweek last year, this was undoubtedly the most popular activity, which is why the whole holiday is being based around robotics this year. The Brainibot is designed by Analogue Information Systems of Edinburgh in collaboration with ATE. Children build a simple chassis with two (independently driven) wheels and one skid. They then solder together a PIC-based controller, assemble and test the robot. The program will (probably) be burnt into the PIC, although strategies for obstacle avoidance and so on can be set by changing trimmers on the circuit board. This year's Brainibot II will be significantly improved over last year's prototypes: the week will end with a Robot Sumo Wrestling (Robobasho?) Championship.

In addition there will be sessions on sensing and control (we are very kindly supported for this by Fischertechnik UK), in movement analysis and description (led by a dancer and choreologist) and more.

The aim of the Superweek, though, is far more than a series of educational sessions. We aim to create a happy, supportive community in which the children feel able to try new ideas and activities regardless of their previous levels of participation or skill. The key to forming this community is in the choice and selection of the monitors - young people, normally aged 18 - 25, who look after groups of 8 - 10 children throughout the holiday. They must all intend a very intensive week-long training course before the holiday in which they learn a huge amount, not only in repertoire of activities but in the attitudes needed to make the group experience happy and successful for all the children who come to us.

For the Robotics holiday, almost all the monitors are also student or professional engineers or scientists. This makes them very strong role models for children who may be thinking of a future career in these areas.

The holiday director will be Ian Johnston, Technology Staff Tutor with the Open University in Scotland, mechanical engineer.

If you think this sounds interesting then please ...

* Visit the ATE website for more information, including full downloadable PDF brochures (<http://www.ate.org.uk>)

* Pass on the word to any children you think might be interested in coming on the holiday. It costs £325 for ten days including escorted travel from most of mainland Britain.

* Pass on the word to any young people, particularly scientists or engineers, you think might be interested in working at the Superweek.

* Let me know of any organisations - schools, museums, science centres, young engineers' clubs or anyone else - who would be interested in hearing more about this. We can either send them printed information or, in many cases, arrange for a speaker to go along and explain what we're about.

6. Items for Next Newsletter

If you have recently held a robotics related activity, and we didn't manage to get to it, then we would welcome reviews (including info such as the sorts of activities you ran, the numbers involved, age ranges etc, comments on what worked well, what didn't work so well and how it could be improved etc)

If you have planned an event, and would like us to give it a plug in the newsletter or on the website (www.robofesta-uk.org) then please send us the details. Likewise if you are planning an event and would like to place a call for ideas, funding or help.

If you are aware of funding opportunities that may be appropriate for financing educational robotics activities, we would also like to make this information available.

In the next issue of the newsletter, we will have a spotlight feature on RoboCup Junior football/RoboSoccer. If you would like to contribute to this feature, please contact robofesta@open.ac.uk

Email: robofesta@open.ac.uk

URL: <http://www.robofesta-uk.org>

Please feel free to link to this URL from your own website.

Electronic copies of this newsletter are available from:

<http://www.robofesta-uk.org/newsletter/02-2002.doc>

<http://www.robofesta-uk.org/newsletter/02-2002.pdf>

If you would like to be removed from our mailing list, or would like to subscribe to it directly, please email robofesta@open.ac.uk

Please feel free to make copies of this newsletter in any medium and pass it on to others who may be interested in it