



Promotional Package

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THE UNIVERSITY OF
WARWICK

Introduction



Warwick Mobile Robotics (WMR) is an ongoing student research project of the Warwick Manufacturing Group (WVG). WVG is an institution within the University of Warwick, dedicated to improving organisational competitiveness through the application of technological innovation.

Project Background

RoboCup Rescue is a competition that tests robots' search and rescue abilities in a simulated disaster environment. The WMR team has chosen to enter this competition as it provides not only an exciting engineering challenge, but a socially significant real world application for mobile robotics. The competition requires tele-operated and autonomous machines to navigate simulated disaster zones. They are required to overcome challenging terrains, identify victims and produce a map of the environment.

This will be the third year of WMR's involvement in RoboCup Rescue. Last year's team achieved third place in the competition and were the most mobile. We aim to continue this legacy of success by developing the accumulated technology and expertise of past teams as well as the department as a whole.

Achievements

The 2008 Team pioneered the UK's involvement in the competition with impressive performance. This success was followed by the 2009 team achieving the *Best Mobility Award* and placing third in the competition overall. WMR also has a history of great success in FIRA MiroSot Robot Football including winning the *UK Robot Football MiroSot Championships* in 2008.

Aims

Our aims for this project (09/10) are as follows:

- Enter the 2010 European RoboCup Rescue League with the goal of winning the competition
- Redesign the robot chassis with the possible use of composite materials
- Redesign the robot arm for inclusion of more sensors (CO₂ detection and two-way communication) and possible gripper
- Improve power to weight ratio of the robot for better range
- Design and manufacture a new robot solely for autonomous section
- Develop mapping ability for both robots through the use of LiDAR (Light Detection And Ranging)
- Identify opportunities to develop the robot for real-life applications

Publicity



WMR is proud of its associations both with the University of Warwick and external partners. We take seriously our aim to advance research and development within the field of robotics as well as to forge collaborative relationships with industry.

University Publicity

WMR is based in a modern, attractive office/laboratory within the International Manufacturing Centre (IMC) on the University of Warwick central campus. We regularly host guests of the WMG and enjoy the chance to share our enthusiasm for our research. Previous visitors include Gordon Brown, Tony Blair and (ex Indian Prime Minister) Abdul Kalam. Our prime location makes us popular with industrial visitors in addition to open day tours for prospective students.

Visits and Media

It is also important to promote interest in robotics by visiting interested parties and demonstrating our work first hand. WMR has featured on the Gadget Show, the UK Mac Show and Richard and Judy, this kind of national exposure has generated a great deal of interest in our work, including interest from the Discovery Channel. We also enjoy involving the younger generation in engineering, through bringing our robot to school activity days as well as fairs aimed at school children.

Responsibilities to Stakeholder

As an important element of WMG we take responsibility for updating all stakeholders with our progress. As well as a regularly updated and visually appealing website (www.mobilerobotics.warwick.ac.uk), WMR distributes a monthly newsletter describing our progress. We use our laboratory, website, uniform, newsletter, university notice boards as well as our robot to publicise our partners. These channels reach a diverse range of students, postgraduates, industry figures and politicians.

Sponsorship Proposal



In order to achieve our aims, specifically to improve the mobility and autonomous operation of the robot, we need to invest in hardware. As such, we are looking to raise £20,000 in cash or equivalent hardware from sponsors. In exchange, we will provide the following publicity for our sponsors:

Contributions up to £2000 or equivalent hardware

- Company Logo displayed on publicity material:
 - The laboratory wall and window displays
 - Bimonthly newsletter distributed to all stakeholders including sponsors and associates
 - Inclusion in all our posters and presentation material
 - Fact sheets on display within our laboratory and the Engineering department
 - Where possible, media coverage including magazines, newspapers and television
- Information about your company and links to your website under the website sponsorship section

Contributions over £2000 or equivalent hardware

Premium Sponsorship; above benefits plus:

- Promotion of your company logo in more prestigious places including:
 - The main page of our website
 - Displayed on our robots, including our competition entries
 - Team uniform and the sponsor banner around our demonstration arena
 - Official stationary and email/letter templates
- Distribution of company literature to world class engineering students and graduates through:
 - Careers information display area located next to student pigeon holes
 - Displays within our highly popular office/laboratory
- Your company information will be displayed on the WMR notice board within the engineering department

Hardware Requirements



For maximum improvements we are looking to invest in the following areas:

Office IT Equipment

A dedicated CAD computer is required to reduce our design time and produce more accurate models for simulation and analysis prior to manufacture. Minimum specification:

- 4GB 800Mhz DDR2
- Q9400 Quad Core Processor
- 512 MB Dedicated Graphics
- Gigabit Ethernet

Sensors (Victim Identification)

Victim identification is a crucial part of search and rescue robotics. To excel in this area we need high quality sensors which, using our programming expertise, can be used to enable autonomous operation.

- LiDAR (laser radar) for 3D mapping for secondary autonomous robot
- CO₂ sensor
- Two way communication
- Development of A.I. software

Mechanical

Mobility is the greatest strength of our robot and we aim to further develop this quality. We see opportunities for improvement through selective upgrades and reengineering, for example:

- New robot arm for mounting sensors
- New motor for front flippers

Miscellaneous

- Funding for competition entrance (travel, insurance etc)
- High performance fans for improved robot cooling
- Composite materials for redesigned chassis to reduce weight
- Gripper for pick and place applications
- High performance electronic connectors

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