

- ABSTRACT -

TELEROBOTICS AND 3-D TV

- WORK AT HARWELL LABORATORY IN REMOTE HANDLING -

Workshop on Telerobotics - A visual definition of current capabilities
Washington, DC 7-9 November 1989

- NASA

The Remote Handling and Robotics Group at AEA Technology's Harwell Laboratory carries out contract research and development into robotics, advanced teleoperation and television systems. Research concentrates on

- telerobotics
- systems integration
- 3-D television
- man-machine interface
- communications
- servo systems
- radiation tolerance
- simulation
- control systems
- imaging

Our prime objective is to provide effective solutions that can be adopted by nuclear facility designers and operators, and our approach to remote handling is to

- use off-the shelf solutions
- adapt and modify existing equipment
- develop special equipment

Currently, our main development focuses on telerobotics and 3-D TV. We define telerobotics as combining all that is best in industrial robotics with all the skills of a human operator to respond to ill-defined and unpredictable tasks. To produce low cost nuclear environment telerobotics we have designed and built the Harwell Input Controller, a 386-based system which accepts input commands from joysticks or, for example, a six degree of freedom force ball, and allows an operator to drive an industrial robot in all six degrees of freedom under joint, world or tool co-ordinator systems. Joint limits and singularities are managed. We are building a Nuclear Engineered Advanced TeleRobot [NEATER] which is a modified industrial robot re-engineered to be suitable for use in many nuclear environments. Finally, we have designed and built successful stereoscopic [3-D] TV Systems which are easy to use for long periods of time and do not produce the discomfort associated with early systems.

Our visual definition will show some of the developments at Harwell in telerobotic decommissioning trials, human factors evaluations of 3-D TV, features of the robot input controller for adaptive control, and performance of the specially developed hydraulic manipulator.

Although the majority of work is related to the nuclear fuel cycle, waste management and decommissioning, we have carried out contract R&D into advanced robotics and space teleoperation.

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