Advanced man-machine interfaces for robot system applications

Results in Brief

Next generation man-machine interface for robot applications

The user interface is the principal factor that facilitates the efficient use of complex software functions by the end user. Robotic applications encapsulate such highly sophisticated functions, however, until now man-machines interfaces were very heterogeneous, developed every time for the specific robotic application. The current project has succeeded in producing an advanced and easy to use user interface that has the potential to become a European industry standard.

DIGITAL ECONOMY

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Many robot manufacturers are producing the robot arm that is applicable to a large number of industrial processes, the automobile industry being one of the most well known applications. A robot, being a mechanical structure composed of rigid parts connected to each other with motorised joints that allow movement, needs a teach pendant, i.e. a user interface, in order to be programmed and directed. Until now each robot system had its own control system resulting in a number of man-machine interfaces and devices, which are incompatible between them.

If computer companies can include the sophisticated robot functions in an easy to use interface and, moreover, if such an interface is not programming language

based, then it is highly expected that these companies would have a substantial advantage in the market. This need for a methodical and user-friendly interface is the main objective of the Advanced Man-machine Interface for Robot system Application (AMIRA) project. This next generation user interface is based on the latest available user interface technology, such as graphical user interface; windows, menu-techniques and icons; hypertext and multimedia. This visual programming environment, apart from enabling easy task programming, it also does not require the user to know the specific programming language that any specific application is using. The project has additionally developed multimedia based tools for training purposes.

In order to evaluate the context of use project partners have designed three questionnaires, one for individuation of users typology, one for tasks specifications and the last for the environment characteristics, which were consequently distributed among users. From the collected data the layout of a new teach pedant has been designed that includes seven horizontal softkeys, six vertical softkeys and a cursor, enter, escape, numeric, undo and help key all symmetrically arranged around an 8'' screen.

The project will finally provide an integrated prototype system, a style guide document and a testing methodology that will all be implemented and validated in an industrial environment.

Even though at present problems related to such high intelligent user interfaces are the object of a relative small market, in the near future given the growth of robotic applications, programming and operation of robot systems is expected to greatly expand.

For more information on the Amira project you may visit the project website.

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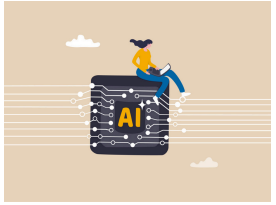

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AMIRA

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