New robot to adopt human thought processes

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A team of computer scientists at the University of Wales, Aberystwyth have secured a major grant to build a robot that uses the same 'thought processes' used by the human brain.

Led by Professor Mark Lee, the Aberystwyth team is joined by academics from six other leading universities who, together, have secured £1.9m of financial backing from the Engineering and Physical Sciences Research Council for the project. The Aberystwyth share is £470k.

According to Professor Lee, the purpose of this project is to try to 'unravel' the way in which the brain works and then build a robot that can 'think' for itself.

"Humans and animals adapt their actions according to what surrounds them, and are able to do several things at the same time and learn from their mistakes. With this project we hope to solve this problem of multi-tasking by using our knowledge of how the brain works."

The team will work on three areas of development. The robot will be built to recognise objects and retrieve them using a robot 'arm' and cameras for 'eyes'. It will also be able to detect features and events in its local environment. Finally it will have the ability to assess the significance of current events, direct attention to the most important and perform appropriate actions.

"All these capabilities will be combined within an overall control system

that makes use of a central selection mechanism, just as we believe occurs in the brain," added Professor Lee.

"Our understanding of how the brain works is also key to the next stage which will involve 'teaching' the robot how to react to things that change around it – for example something which could potentially distract it from the task it has been set. It will also be able to learn from its mistakes just as humans do."

"Once the robot has been constructed we will then 'stand back' and ask the question 'what general features of the model gave it its ability to integrate its behaviours successfully?' By doing this we hope to be able to transfer our work into a wider range of robots designed for many different tasks."

Professor Lee is particularly interested in robots that can provide assistance for the disabled, the old and the infirm, and the advantages of developing them to work in dangerous, hostile or inaccessible environments.

The full project team is made up of mathematicians, control engineers, computer modellers and neuroscientists. The five year project has also secured the backing of industrial sponsor BAE Systems.