

## Chapter 82

# The MuseBot Project: Robotics, Informatic, and Economics Strategies for Museums

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### ABSTRACT

*This chapter intends to present the MuseBot system as the result of multidisciplinary research, underway at the University of Cassino and Southern Latium, which focuses on the use of robots for visiting a museum during closing time. During the visit the visitor, connected to the robot through a home computer, smartphone or tablet can control and “drive” the device through the halls of the museum. During the virtual tour the visitor, focusing and viewing the various works on display can get a simple view or an extended examination of the work that he/she is looking at, through a specially prepared multimedia database.*

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## **INTRODUCTION**

Interactions between cultural heritage and IT are now numerous and unanimously recognised and used. There are many examples that have allowed us to analyse, investigate, recover and enjoy works of art through diverse applications of new technologies. Currently, among those addressed in particular to wider use of museums, there is now the widespread opportunity to make a virtual multimedia tour of exhibition rooms using video navigation, by connecting to the web from one's computer. On the other hand, the combination of robotics and BBCC has not yet found wide application because there are, in fact, few applications that envisage the presence of the robot on site with the visitor connected remotely.

A prime example is the mobile robot for the use and 3D reconstruction of a Palaeolithic cave, developed by the Istituto di Studi sui Sistemi Intelligenti per l'Automazione CNR – ISSIA (Institute of Intelligent Systems for Automation – CNR), Bari. It is an autonomous, mobile robot to remotely access a grotto full of prehistoric paintings and archaeological finds. The robot is able to explore the environment and assume determined positions. The prototype is formed of a mobile robotic platform equipped with a laser sensor, ultrasonic sensors, inclinometers, a camera, a compass and an antenna for wireless communication between the robot and a remote computer. The robot platform is formed of four off-road wheels to handle the gradients. In addition, there are sixteen sonar sensors positioned at the front and back of the robot that are able to identify obstacles. The robotic platform contains four motors, a local processor and batteries. A laser sensor has been installed on the platform that is able to identify objects. A support has also been positioned on the platform at the right height to hold the lighting system and camera on top of it.

Another prototype is the CICEROBOT, a museum robot created by the Department of Computer Engineering and Icar-CNR in Palermo. It is a descendant of Rhino, a pioneer museum robot made in 1987 by the University of Bonn. Cicerobot allows you to plan your visit according to your needs, and is able to guide tourists through the museum, avoiding obstacles and queues. It is equipped with a keyboard, a monitor, a camera and sensors connected to an internet node, which people outside the museum can also connect to for a virtual visit. The same node allows it to be controlled remotely. The Cicerone robot could be the forerunner to a series of robots for tourism, art and archaeology.

Finally we would like to mention "After Dark" research project that won first edition of IK Prize. This prize was established in 2013 to commemorate Irene Kreitman, who was a generous philanthropist and longstanding supporter of Tate. The prize rewards ideas able to exploit digital technology and create a link between Tate Britain Art Gallery and the general public. The project successfully exploits the closing time of the Museum, thanks to remote controlled robotic devices that are the main components of the project. Four android plus one, about one meter and 20 cm high, equipped with cameras and spotlights will be the legs and the eye of Internet users during the night and then disappear by day. The internet users will control in turn the robot, creating their own itinerary and seeing the video in real time on their computer. Each visitor will be able to drive for a limited time, while the line will be managed by an automated system (After Dark, 2013).

## **THE MUSEBOT PROJECT**

The MuseBot project builds on the British "After Dark" experience, with the intention to move forward, expanding and enriching the experience of a museum visit.

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