

Guard@Lis: Birdwatching Augmented Reality Mobile Application

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Abstract : Nowadays, it is common to find people who are concerned about getting away from the everyday life routine, looking forward to outcome well-being and pleasant emotions. Trying to disconnect themselves from the usual places of work and residence, they pursue different places, such as tourist destinations, aiming to have unexpected experiences. In order to make this exploration process easier, cities and tourism agencies seek new opportunities and solutions, creating routes with diverse cultural landmarks, including natural landscapes and historic buildings. These offers frequently aspire to the preservation of the local patrimony. In nature and wildlife, birdwatching is an activity that has been increasing, both in cities and in the countryside. This activity seeks to find, observe and identify the diversity of birds that live permanently or temporarily in these places, and it is usually supported by birdwatching guides. Leiria (Portugal) is a well-known city, presenting several historical and natural landmarks, like the Lis river and the castle where King D. Dinis lived in the 13th century. Along the Lis River, a conservation process was carried out and a pedestrian route was created (Polis project). This is considered an excellent spot for birdwatching, especially for the gray heron (*Ardea cinerea*) and for the kingfisher (*Alcedo atthis*). There is also a route through the city, from the riverside to the castle, which encloses a characterized variety of species, such as the barn swallow (*Hirundo rustica*), known for passing through different seasons of the year. Birdwatching is sometimes a difficult task since it is not always possible to see all bird species that inhabit a given place. For this reason, a need to create a technological solution was found to ease this activity. This project aims to encourage people to learn about the various species of birds that live along the Lis River and to promote the preservation of nature in a conscious way. This work is being conducted in collaboration with Leiria Municipal Council and with the Environmental Interpretation Centre. It intends to show the majesty of the Lis River, a place visited daily by several people, such as children and families, who use it for didactic and recreational activities. We are developing a mobile multi-platform application (Guard@Lis) that allows bird species to be observed along a given route, using representative digital 3D models through the integration of augmented reality technologies. Guard@Lis displays a route with points of interest for birdwatching and a list of species for each point of interest, along with scientific information, images and sounds for every species. For some birds, to ensure their observation, the user can watch them in loco, in their real and natural environment, with their mobile device by means of augmented reality, giving the sensation of presence of these birds, even if they cannot be seen in that place at that moment. The augmented reality feature is being developed with Vuforia SDK, using a hybrid approach to recognition and tracking processes, combining marks and geolocation techniques. This application proposes routes and notifies users with alerts for the possibility of viewing models of augmented reality birds. The final Guard@Lis prototype will be tested by volunteers in-situ.

Keywords : augmented reality, birdwatching route, mobile application, nature tourism, watch birds using augmented reality

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