

Interactive and Stereoscopic Hybrid 3D Viewer of Radar Data with Gesture Recognition

Jon Goenetxea, Aitor Moreno, Luis Unzueta, Andoni Galdós, and Álvaro Segura

Vicomtech. Mikeletegi Pasealekua 57, Parque Tecnológico 20009, Donostia-San Sebastián, Spain

{jgoenetxea, amoreno, lunzueta, agaldos, asegura}@vicomtech.org
<http://www.vicomtech.es>

Abstract. This work presents an interactive and stereoscopic 3D viewer of weather information coming from a Doppler radar. The hybrid system shows a GIS model of the regional zone where the radar is located and the corresponding reconstructed 3D volume weather data. To enhance the immersiveness of the navigation, stereoscopic visualization has been added to the viewer, using a polarized glasses based system. The user can interact with the 3D virtual world using a Nintendo Wiimote for navigating through it and a Nintendo Wii Nunchuk for giving commands by means of hand gestures. We also present a dynamic gesture recognition procedure that measures the temporal advance of the performed gesture postures. Experimental results show how dynamic gestures are effectively recognized so that a more natural interaction and immersive navigation in the virtual world is achieved.

Key words: Stereo Visualization, Weather Doppler Radar, Gesture Recognition, Human-Computer Interaction, Hybrid System

1 Introduction

The display of meteorological data is being utilised in several fields. From the meteorological research centres to the broadcast networks, the weather information has been utilised to show their users or audience some visual conceptions of the large amount of raw information. For years, 2D maps and diagrams have been used to represent temperatures and surface pressures forecasting, results from the predictive models. Also, meteorologists need to access and visualize historical data for their reports [12].

The increment in the number of weather stations and the introduction of advanced weather instruments such as weather radar or wind profilers provides a huge amount of new data that requires an adaptation of the existing visualization methods or the creation of new ones in order to allow users to understand it. Specifically, data acquired by weather radars cannot be easily represented in a traditional 2D figure and therefore, lot of previous scientific works have researched about how the weather radar information could be represented in 3D [1, 3].