

Chapter 21

Visualisation and Auralisation for Perception–Driven Decision Supports in Planning: A Comparative Review

Like Jiang
University of Surrey, UK

ABSTRACT

Visualisation and auralisation are among the essential technologies for perception-driven decision support in landscape planning and soundscape planning, respectively. By making proposed developments and environmental changes visible and audible, they allow decision-makings based on perceptual experience, providing a “common language” that all the stakeholders are capable of using to communicate and to exchange ideas. While they share common function and criteria when used for decision support in planning, they are not in parallel developments and have been approached differently regarding their applications. This chapter comparatively reviews the developments and applications of visualisation and auralisation for perception-driven decision support in planning, aiming to provide technological and methodological insights into the two interconnected yet somewhat independent subjects. This led to indications for new developments and optimized applications in the near future. The chapter addresses three issues: validity, contents to present, and ways to present.

INTRODUCTION

Perception-driven evaluation, assessment and design assess the quality of the environment based on human perceptual response to the biophysical features of the environment. Advantage of the perception-driven approaches for landscape planning (Daniel, 2001; Lothian, 1999) and soundscape planning (De Coensel et al., 2009, Ruotolo et al., 2013) is that they highlight human experience in the environment, instead of simply examining measured indicators of the biophysical features. Moreover, perception-driven approaches can help involve the public as equal and capable partners in decision-making in landscape

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planning (Lange & Hehl-Lange, 2005; Orland, 2015) and soundscape planning (Finne & Fryd, 2016; Stienen & Vorländer, 2015), since it does not require expert knowledge or skills to make perceptual judgements on the environment.

Visualisation and auralisation are among the vital technologies to enable and to improve perception-driven decision-support in landscape planning and soundscape planning respectively. Visualisation in landscape planning is a collection of technologies for graphical representations of proposed developments and/or impacts on landscape (Schroth, Wissen Hayek, Lange, Sheppard, & Schmid 2011; Sheppard, 2001). For the scope of perception-driven decision support, visualisation in this chapter refers specifically to creation of landscape surrogates which are used to portray perspective views of landscapes, rather than visualisation in forms of design plans, mappings or information visualisation. Figure 1 gives an example of the concerned visualization. Visualisation traditionally included drawings and scale models. Since the 1960s, photographs and photomontages have been widely used (Lovett et al., 2015). Examples can be found in Smardon, Palmer, & Felleman. (1986, pp. 193) and Landscape Institute & Institute of Environmental Management and Assessment (2002, pp. 57). Photo-based visualisations are effective and straightforward solutions for highly detailed and realistic landscape representations. However, in situations where a larger number of viewpoints or alternative scenarios are needed, they can be quite time-consuming. More recently, computer-based 3D visualisation has enjoyed rapid development and become the most common approach of visualisation today (Lovett, Appleton, Warren-Kretzschmar, & Von Haaren, 2015). Computer-based 3D visualisation has advantageous in links with GIS data (Ode, Fry, Tveit, Messenger, & Miller, 2009) and scenario manipulation (Bishop & Miller, 2007). In addition, the real-time rendering capability of computer-based visualisation has increased the interactivity of presented landscape, e.g. free navigation (Appleton & Lovett, 2009) and display control (Salter, Camp-

Figure 1. An example of the visulisation that portrays a perspective view of the landscape
Source: the author



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