

Modelling approaches in Islamic Architectural designs

Abstract

Architectural designs contribute as one of the main factors that should be considered in minimizing negative impacts in planning and structural development in buildings such as in mosques. In this paper, the ergonomics perspective is revisited which hence focuses on the conditional factors involving organisational, psychological, social and population as a whole. This paper tries to highlight the functional and architectural integration with ecstatic elements in the form of decorative and ornamental outlay as well as incorporating the building structure such as wall, domes and gates. This paper further focuses the mathematical aspects of the architectural designs such as polar equations and the golden ratio. These designs are modelled into mathematical equations of various forms, while the golden ratio in mosque is verified using two techniques namely, the geometric construction and the numerical method. The exemplary designs are taken from the Sabah Bandaraya Mosque in Likas, Kota Kinabalu and the Sarawak State Mosque in Kuching, while the Universiti Malaysia Sabah Mosque is used for the Golden Ratio. Results show that Islamic architectural buildings and designs have long had mathematical concepts and techniques underlying its foundation, hence, a modelling approach is needed to rejuvenate these Islamic designs.