

A Robotic Approach to Design an Automatic Marionette Puppet Theatre: A Feasibility Study

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Abstract. Puppetry is an ancient entertainment method used by people to release their stress and represent stories. The puppet figure may be an object that resembles a person, an animal, or a mythical character controlled by a human using external help like rods or strings. The human who controls the puppet is known as the puppeteer. There are various types of puppets namely, marionettes, hand puppets, rod puppets, shadow puppets, and finger puppets. With the advancement of technology, the popularity of the art of puppetry has decreased with time due to many reasons. The main reason is the lack of new puppeteers to continue puppetry and puppeteers get lower earnings, so new puppeteers don't motivate to continue the puppet industry. Another reason is that with the advancement in technology, people have lost interest in traditional entertainment methods like puppetry, because of the increase in new entertainment methods like TV and mobile phones. After several studies, we decided that marionettes are the most suited type of puppet to develop an automatic puppet theatre base on robot technology. According to the data we collected, there are four automatic systems, and they all use different mechanisms to control the puppet including quadrotors, motion capture data, and automatic stage management technologies. This comparative research is conducted to study the existing systems and robotic technologies to identify the most suited requirements and mechanisms for a robotic-based automatic puppet system. Finally, we hope this research will be helpful to protect the art of puppetry to stay alive for a longer period in Sri Lanka and other counties as well.

Keywords: *Puppetry, Robotics, Marionette, Puppet Theatre*