

## **MAKER: iTutor - Intelligent Tennis Tutor**

**Dr. Hugh Jack P.E., Western Carolina University**

Dr. Jack is not the author. The abstract has been submitted on behalf of Kaviarasu P, Gokul Kannan, Kesava Mani, M H Ashik , Navin S - Kumaraguru College of Technology, Coimbatore, India.

## **iTutor - Intelligent Tennis Tutor**

**Authors:** Kaviarasu P, Gokul Kannan, Kesava Mani, M H Ashik , Navin S

Kumaraguru College of Technology, Coimbatore, India

### **Abstract**

Tennis has been always been a sport of choice for many around the world. In India, it was introduced by the British in late eighteenth century. Ever since, tennis has emerged into a major sport in India. In the current scenario, the coach to player ratio is too wide and the existing tennis machines are imported from various countries and affordable only for a small section of players. Moreover there are many differently abled players who are aspiring to play tennis and represent their country in the Paralympics tennis competitions.

iTutor is one of a kind assisting machine with power packed features that aims to make tennis accessible to all players. iTutor which was first developed for Paralympics players, now serves as intelligent machine for players from a beginner to a professional. iTutor can serve many purpose with not just passively training the player by shooting ball, but also shooting real time analytics on performance of the player. With 3 Degrees Of Freedom (DOF), the player can be effectively trained by shooting balls with varied speed, spin and position. A camera interface on the machine enables the professional coach to remotely view the play, as a result of which in-person like training session is achieved. Average cost of training a player to play tennis in India is about Rs 50,00,000 per year which includes a professional coach. By competitively pricing the machine, it is made affordable to the majority of budding players especially in developing countries like India. This effectively increases the market base of iTutor.

iTutor comes in two versions. The iTutor-Elite provides the basic feature of shooting the ball utilizing 3 DOF. The ball can be made to shoot in different angle, spin and velocity by covering all areas of the court. This model is suitable for players who require only practice sessions. All additional features are included in the iTutor-Premium model which provides the analytics of the player which is done by attaching an add-on module. This module consists of a camera and a controller which recognises the style in which the player performs. This data is constantly uploaded to a backend which acts as a computation and storage medium. By learning the data acquired in cloud, a response of how the player can be made to perform well is recommended by the machine in the ground. This feature is made optional where players with necessity can buy this on a monthly subscription. Discounts can be provided if the customer opts for bulk purchase of the performance data on a half-yearly or yearly basis. Another useful feature is the remote assistance of the coach. Using the camera module on the machine, the player's practise session is live fed to coach. Coach will have an app installed in his phone which enables the live communication between the player and coach possible.

Continuous research is being carried out on the tutor to improve its functions and to optimize the design to lower the weight of the machine. Also, to lower the cost of the machine, hardware used will be de-cluttered by making a custom robust printed circuit board (PCB) which houses all the electronic components inside. Once an optimal solution is reached, the product can be made first of its kind personal tutoring machine in the world.