

# ProtoXGamingGlove – A Robust Alternative for Conventional Input Devices

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**Abstract**— In the past decade there have been many computer input devices that helped the user. Yet these devices have limitations such as inability to customize, lack of support for using multiple devices in parallel and support for natural interaction. In this paper the authors have presented a new input device that has the capability of providing not just one device function but a combination of functions from many devices. The study introduces a new technology called “SkinTouch-Inputs” using Ultra-Sonic Ranger as an alternative for the keyboard and gamepad buttons. This enables the user to customize the gaming environment according to his preference. The ProtoXGamingGlove (PXG<sup>2</sup>) combines the capabilities of mouse, keyboard, joystick and gamepad by using accelerometer, thumb slide joystick, soft buttons and SkinTouch-Inputs in a manner which is intuitive. The PXG<sup>2</sup> was tested under three gaming categories: strategy, simulation and First Person Shooter by multiple users. The tests confirmed that the PXG<sup>2</sup> was a robust alternative for traditional input devices. Evaluations with end users proved that it is a user friendly device which can be adapted to any gaming environment. This paper also includes current progress and future enhancements of the PXG<sup>2</sup>.

## I. INTRODUCTION

The advancement of technology has introduced several input devices to the computer industry, ranging from simple keyboard and mouse to various advanced input devices such as AirMouse, AK-39 Rugged Wearable Keyboard, Gamepad, project natal and Peregrine Gaming Glove that enhances user interactions. However most of the input devices are specifically manufactured to operate and navigate within one functionality.

This paper proposes an input device ProtoXGamingGlove (PXG<sup>2</sup>) that combines a selected set of inputs that facilitates standard input functionalities and gaming functionalities. That incorporates new technology “SkinTouch-Input” that is capable of performing functionalities as a combination of variety of input devices. That includes Ultra-Sonic Ranger which replaces the tasks that carried by gamepad buttons and the keyboard keys. PXG<sup>2</sup> proposes an innovative solution that combines the below technology, *Accelerometer, Thumb Joystick, and Soft Buttons* with the facility to play game and us as a tool to manipulate

(drawing) 3D objects in day to day life while in a relax position.

## II. BACKGROUND

In the course of the development in gaming and computer input devices there have been many progresses, In the early 1980s and 1990s there were two glove base devices. *Optical flex sensor Zimmerman* by Thomas G under the United States Patent 4542291 and *The optical flex sensor used in the Data Glove* by Young L under the United States Patent 5097252. ShapeHand, the P5 Glove is 5th Glove and CyberGlove introduced to provide better user interaction, however with the technological developments these glove-like peripheral devices, that only enabled proprietary bend sensor or remote tracking technologies, were totally re-developed to be intuitive interaction with 3D and virtual environments and Mouse-mode compatibilities. These are the basic functions that these devices are capable of. And these gloves have only been available at a huge cost. Glove base devices that are now available for use to interact. One of the first wired gloves available to home users in 1987 was the Nintendo Power Glove. This was designed as a gaming glove for the Nintendo Entertainment System. It had a crude tracker and finger bend sensors, plus buttons on the back.

This was followed by the CyberGlove, created by Virtual Technologies, Inc. in 1990. Virtual Technologies was acquired by Immersion Corporation in September 2000. In 2009, the CyberGlove line of products was divested by Immersion Corporation.

In 2002, the P5 Glove was released. In normal applications, it worked as a 2 dimensional mouse and a few computer games were specially adapted to provide "3D" support for it. The P5 glove is compatible with Microsoft Windows XP and Mac OS version 9 or below. Unofficial drivers for Linux exist as well. While it received some positive reviews from gadget and gaming magazines, its lack of compatible