Shim Dance Application

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***Abstract*—Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nulla sed tempor mauris. Fusce pellentesque libero at eleifend mollis. Nunc nibh felis, sodales et tellus eget, luctus sollicitudin diam. Proin libero lectus, tincidunt ac ornare vel, malesuada vitae mi. Aliquam nec lectus quis urna semper imperdiet ac sed neque. Proin pretium odio quis diam lacinia blandit. Morbi nec consectetur justo. Nulla turpis turpis, consectetur nec eros at, molestie bibendum metus. Curabitur egestas justo nulla, congue dignissim purus molestie eget. Vivamus auctor luctus nibh eu efficitur.**

I. Motivation

There exist various dance games for Android platform. But in most cases the player interactions are limited to the screen [6]. Despising the fact that this conflict with the dance nature itself (which is the movement of whole body), it shows the great limitation of today mobile devices in user interaction.

There is one game which recognizes player movements [5]. In this case phone is used as a game controller and movements are read from one hand. We wanted to focus on player feet.

Outside of the mobile world there exist dance game controllers for feet [1], [2]. But those solutions are not suitable for mobile applications.

Our goal was to create dance game application for Android where game controllers are player feet. We also wanted to replace external physical controllers with shimmer sensors to read player movements directly from they feet [3].

II. Methods

A. Hardware & Software

Two shimmer sensors are used as a motion capture devices. The second edition of the device is used with *BTStream v1.0* firmware, as well as the calibration software provided by the vendor [4]. Sensors are placed on the front of the feet with orientation shown on Fig. 1. Only accelerometer sensors are used with range set to $6\,G$ and with any of sampling rates: $102,4\,Hz, 128\,Hz, 170,7\,Hz, 204,8\,Hz, 256\,Hz$.

Following mobile devices were used:

1) Samsung Galaxy s4 mini LTE with Android 4.4.2
2) Samsung Galaxy s5 with Android 5.0.0
3) Samsung Galaxy Tab 2 with Android ...

For development process Android Studio 1.0.2 was used with target SDK version 11. Application was created based on *aasbase* project provided by Pattern Recognition Lab (CS 5), Digital Sports Group from Friedrich-Alexander Universität in Erlangen. It uses shimmerresearch package in 1.1.3 version.

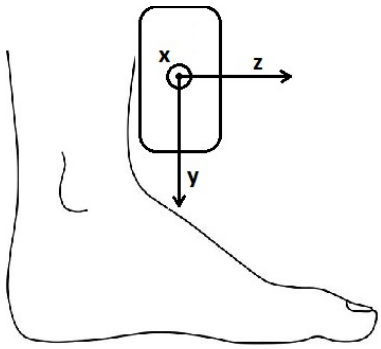

Fig. 1. Placement of the Shimmer sensor on the left foot. Y axis is pointing down, Z axis is pointing forward (with respect to the person wearing the sensor) and the X axis is pointing to the right. The same sensor orientation should be used in the right foot.

B. Data acquisition

C. Preprocessing

D. Game & Graphic control

E. Synchronization of application modules

III. Results

IV. Discussion

V. Summary and outlook

In the future we can expect to see technology such as Project Soli which will allow to recognize user motions far from device [7].

Acknowledgment

References

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