Pre project Report on Dance IOT

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1 Introduction

Dance is an art. It is the form of expressing ones feelings symbolically using mental and physical aspects.Technically portraying an art like Dance is the recent ideas which has evolved out to be a challenging tasks from the past decade. On the other hand, technologies like IOT(Internet of Things) is in a huge demand, wherein the world is looking to integrate IOT with everything. The bridge between Art and technology is IOT. The Dance IOT is a project where the Dance forms are analysed and mapped onto an industrial arm, so that the replica actions are performed. This is something similar to andro-humanoid robot.

2 Pre Project Analysis

2.1 Initiation:

This project is a collaboration of art and technology. The main motto lies in using IOT as the combining tool.There would be possibly three main domains in this project,categorised on the basis of modular functionality in achieving it.The following are the three functionaries:

1. Sample acquisition
2. Mathematical Mapping
3. Replication from Industrial Arm

Figuring all the possible ways, the main goal of this project would be to find out a mathematical mapping relation between the sensed data and the electro-mechanical movement of the arm.The process of designing such a system requires the perfect understanding of the components and their outcomes.

2.2 Modules and Tools:

1. Device to sense the motion of the dancer's arm: Generally , there are sensors which can sense motion and detect its path of movement as well.Out

from various sources today,I found out PIR Sensor and Accelerometer are the two most common sensing devices used in motion detection. A PIR sensor(Passive Infrared Sensor) detects the movement of the body on the basis of amount of heat liberated by that body. Thus, when the sensor finds variation in the movement of object in the form of heat,it sends an indication that there is a movement. Accelerometer is a electrmechanical device, which detects the movement of a particle.It works on the principle of Piezoelectric effect or sometimes even on MEMS technology. Piezoelectric effect is the electric charge generated in response due to mechanical stress. MEMS(Micro Electro Mechanical Sensors) finds out displacement of small proof mass etched into silicon surface of the IC and suspended by small beams.

2. Mathematical Mapping Tools: Mathematically mapping a read set of data in the form array into a meaningful translated actions of robot is a software job. It does not require any physical components.Finding out a mathematical map is the main motto of our project as mentioned above. This requires a lot of knowledge on inbuilt libraries and software similar to programming.This all has to be done once the source of sensed data is available.

3. Industrial Arm: An Industrial arm is an electrically controlled mechanical device, which is basically a virtual arm analogous to Human Biological Arm.An Industrial arm can be controlled by the code written and mapped methodologies using mathematical functions.

3 Sources and Journals:

1. Gesture spotting with body-worn inertial sensors to detect user activities by Holger Junker, Olive rAmft,Paul Lukowicz, Gerhard Tröster

2. Detection of eating and drinking arm gestures using inertial body-worn sensors by Oliver Amft, Holger Junker, Gerhard Troster Wearable Computing Lab, ETH Zurich, Switzerland

3. https://www.youtube.com/watch?v=b-V$_6C12ZRI$