

BUSITEMA UNIVERSITY  
FACULTY OF ENGINEERING  
DEPARTMENT OF COMPUTER ENGINEERING  
SATELLITE DISH ANTENNA POSITIONING SYSTEM BASED ON  
ANDROID TECHNOLOGY.

BY

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**DECLARATION**

**I NYAKAHUMA CLOVIS REG No: BU/UG/2013/1583** hereby declare that this project report is my original work except where explicit citation has been made and it has not been presented to any institution of higher learning for any academic award.

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**APPROVAL.**

This is to certify that the project report under the title “**Satellite Dish Antenna Positioning System Based on Android Technology**” has been done under my supervision and is now ready for examination.

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## **LIST OF ACRONYMS.**

IR	Infra-Red
ADT	Android Development Tool
API	Application Programming Interface
APP	Application
APK	Android Package
BT	Bluetooth
OS	Operating System
PC	Personal Computer
SDK	Software Development Kit
JDK	Java Development Kit
JRE	Java Runtime Environment
RF	Radio Frequency
Wi-Fi	Wireless fidelity
DC	Direct Current
KHz	Kilohertz
GHz	Gigahertz
CW	Clockwise
CCW	Counter Clockwise
GEO	Geostationary Earth Orbit
LNB	Low Noise Block down Converter

LAN	Low Area Network
IEEE	Institute of Electrical and Electronic Engineers
ISM	Industrial, Scientific and Medical
IC	Integrated Circuit
GUI	Graphical User Interface
QEMU	Quick Emulator
IDE	Integrated Development Environment
TV	Television
DStv	Digital Satellite Television

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## **AN ABSTRACT.**

This report presents satellite dish antenna positioning system based on android technology control system to position dish antenna to a desired elevation and azimuth angle for maximum power/signal reception from the satellite. The main reason of using a dish antenna is to receive signals from satellites and other broadcasting sources. Currently in order to get the exact angle of position of the dish, it needs to be adjusted manually and to overcome the difficulty of adjusting manually, this project helps in adjusting the position of the dish through an android application control. Android application control acts as a transmitter whose data is received the Bluetooth module HO6 which is interfaced to a microcontroller which also relays the commands to steppers motor via the driver. The android application control sends ASCII coded data to the Bluetooth module HO6 receiver whose output is then sent to the microcontroller. A prototype dish antenna is constructed and then positioned by using the developed control system. Results show very good agreement between the desired position and the actual position of the dish antenna. Android application remote operation control is achieved by any smart-phone/Tablet with Android OS, upon a GUI (Graphical User Interface) based touch screen operation.



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## **CHAPTER ONE. INTRODUCTION**

### **1.0 INTRODUCTION.**

This chapter comprises of background, problem statement, objectives, justification and scope of the study.

### **1.1 BACKGROUND**

Currently communication satellites play a major role in telecommunication, television and radio signal distribution, computer communication and military command and control. Geo-stationary satellites, which were first introduced during the sixties, have now increased in numbers because of their immense contributions to global communications[1]. A substantial number of people are seen purchasing satellite dish antennas as they seek to be part of the digital migration as well as the quality of images inherent to the satellite services. At present, the importance of dish antenna is to receive signals from the satellites and in order to receive maximum signal strength from the satellite, the receiving dish antenna requires correct positioning both at specific azimuth and elevation angles so as to in line of sight with the desired satellite[2].

On the other hand, satellite communication, however, is limited to the orbiting satellite's footprint, drifting of satellite within their orbits and adverse weather conditions like heavy winds and earthquake can lead to the drifting of the satellite dish antennas from their originally mounted position.

Now days Professional satellite installers use signal meters to adjust satellite dish antennas to their maximum signal strength and it also is possible for users to adjust dish antenna themselves without a signal meter by using the signal strength utility included in the receiver software which requires two people; one to monitor the signal strength on the receiver, while the other is outside adjusting the satellite dish antenna.

Therefore there is a need of the developed system that employs android and Bluetooth technologies to position dish antennas.

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