ROBOSOCCOR COMPITITION

PROPOSAL

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Introduction

Objective

In our perspective the objective of this competition is to gain knowledge and experience in the field of artificial intelligence. As we all know, AI is very interesting field that could benefit not just the university but also the country in ways no other fields could. Some of the advantage of AI are

- ➢ With artificial intelligence, the chances of error are almost nil and greater **precision** and **accuracy** is achieved.
- ➢ Fraud detection
- ➢ digital assistants who interact with the users
- ➢ Artificial intelligence can be utilized in carrying out repetitive and time-consuming tasks efficiently
- ➢ Intelligent machines can be employed to do certain dangerous tasks.
  - o Mining
  - o Military
- ➢ Surgery simulators use machine intelligence in training medical professionals
- ➢ Best of all this competition will help the university to achieve its goal of becoming one of the top universities in Africa.
- ➢ This competition will also motivate and prepare youngsters for the modern future we are headed.

The above is just a glimpse into the world of Artificial Intelligence but we hope it will give you a good view on how important AI is for the country future plan. This competition is also a very efficient way of nurturing students in this field we are excited to participate and compete.

Design Specification

Our robots computation power will be mainly pc based but we will also try to incorporate the advantages of smartphone based system.

a) Electrical and Electronics Design

In the electrical design part, we will need different electronics components

Servos will be used to adjust the camera tilt mechanism due to the cameras limited vision

HC-SR04 (ultrasonic range sensor) used to get the distance between the ball and the robot

Arduino-ProMini board used to control the robot

Power Bank   used for powering the components

Wireless Camera used for vision system

HC05(Bluetooth module) communication between pc and Arduino

GY80(imu) to get data like position(compass)

b) Mechanical Design

modifying the mechanical parts of the original Robosapien is not our main objective because its time consuming and needs a lot of hardware so it is cost wisely inefficient but we will try to give the robot good degree of freedom we won't be making much modification to the robot.

c) Software and AI

This is the part is where we will be most concerned mainly because it doesn't require many resources besides a computer and access to different resources(books and tutorials).In addition, this is the most important part which is enabling a machine to think like humans so we will use different image processing and machine learning techniques.

Implementation Strategy

a) Material purchasing

This competition has great educational impact nationwide not just for students in higher level but also for the young minds thus it is our best hope that our university will cover the expenses, but we will also try to find sponsors.

b) Team management tools and techniques

We will meet on a daily basis to assess our achievements and weaknesses we will also use different platforms to share our resources, post questions and look for help.

c) Winning strategy

The method to win is obviously designing highly intelligent robot that will outsmart our opponents and the method to do this is to have a good skill on programming and that's why our team included a large number of computer engineering students so that we can modularize and implement the system in time.

S.W.O.T

a) Strength

Our strength is our commitment to learn and gain new skill. More importantly, our Undying desire to explore new technologies.

b) Weakness

Allocating time to do the project while attending to our regular academic classes will be a bit difficult.

c) Surrounding opportunity

Our campus offers 24/7 free internet access, so it is the right place for this competition and we hope that we will get all the help of our teachers as well as the university.

d) Threat

The main threats are finding the components per our specification and also finding sponsors and also this type of competition is first of its kind at least in Ethiopia so acquiring the skills and knowledge to do this project will require time.

Cost breakdown

Source: www.amazon.com

components	Minimum number	price	Preferable number	price
Robosapien-V1	3	3* $79	4	4*$79
GY80	4	4*$36.30	5	5*$36.30
HC05	4	4*$8.51	5	5*$8.51
HC-SR04	4	4*$7.25	5	5*$7.25
Arduino-ProMini	4	4*$14	5	5*$14
Power Bank	4	4*$15	5	5*$15
Servo motors	8	8*$10	10	9*$10
Wireless Camera	4	4*$20	6	6*$20
	total	**$721.4**	**total**	**$931.3**

Reference

Robosapien-V1
http://www.amazon.com/WowWee-Robosapien-Humanoid-Remote-Control/dp/B000161RFA

GY80
http://www.amazon.com/BMP085-9-Axis-Magnetic-Acceleration-Gyroscope/dp/B009M1J8E2/ref=sr_1_2?s=electronics&ie=UTF8&qid=1453101092&sr=1-2&keywords=GY-80+BMP085+9-Axis

HC05
http://www.amazon.com/Bluetooth-converter-serial-communication-master/dp/B008AVPE6Q

HC-SR04

http://www.amazon.com/SainSmart-HC-SR04-Ranging-Detector-Distance/dp/B004U8TOE6

Arduino-ProMini

http://www.amazon.com/Arduino-Pro-Mini-328-16MHz/dp/B004G53J5I

Power Bank

http://www.amazon.com/Vinsic-Tulip-3200mAh-External-Battery/dp/B00KEGYXRQ

Servo motors

http://www.amazon.com/MG90S-Micro-Servo-Helicopter-Plane/dp/B006VRWV1W

Wireless Camera

http://www.amazon.com/Wireless-Color-Camera-Complete-Package/dp/B000JCQKVM/ref=pd_rhf_gw_p_img_9?ie=UTF8&refRID=01HWE4K1WXZ7E JTX5DR4

Thus we need minimally **$721.4** us dollars

Preferably $931.3 us dollars

And I would like to remind u that all thus components can be reused for different purposes including as lab equipment for students.

Future Goal

This competition is great but it is also just a beginning. The field of Artificial intelligence is untouched not just in Ethiopia but also in the world. In the upcoming few years it is going to change lives for the better and we would like Ethiopia to be part of this change so we will do everything we can to ensure this and we are sure the government thinks the same way.