RERF Group of Institutions
Splendora 2019
Project Proposal

1. **Department: Civil Engineering**

2. **Title: Water Treatment Plant**

3. **Problem Statement:**

   Category (Software / Hardware / Both): **Hardware**
   Remarks (if any):

4. **Abstract (100 Words Max):**

This project aims to design and implement an advanced and eco-friendly water treatment facility. The project focuses on incorporating cutting-edge technologies and innovative processes to ensure the effective removal of contaminants, pathogens, and pollutants from water sources. Emphasizing sustainability and environmental responsibility, the project seeks to optimize energy consumption and minimize waste generation during the treatment process.

5. **Budget / Requirements:**
   Maximum Time required to complete the project (in weeks): 8 weeks.
   Area requirement to display the project (In Sqm):2.25 Sqm.
   No. of students assigned (or needed to be assigned) to the project:5

6. **List of Apparatus / Instrument / Raw material:**

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	Water Filter Cartridges	Sediment and activated carbon filters	2
2	UV Sterilizer	UV lamp for water disinfection	1
3	Reverse Osmosis (RO) Membrane	RO membrane for water purification	1
4	Water Storage Container	Food-grade plastic container	1
5	PVC Pipes and Fittings	Convey water through the treatment system	As required
6	Hose and Tubing	Connect various components	As required
7	Water Testing Kit	Basic water quality testing equipment	1
8	Safety Gear	Gloves, goggles, and masks for safety	As required
9	Miscellaneous	Miscellaneous tools and consumables	As required

7. **Is this an interdisciplinary project (Yes / No): Yes**
8. **Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No):No**
9. **If yes, name the other departments: NA**
10. **Are you collaborating with other research organisation / institutes? (Yes / No):No**
11. **If yes, acknowledge organisation: NA**

(Signature of HOD)

Name: SATABDI SAHA

Approved

HOD CIVIL

PRINCIPAL
BARRACKPORE

RERF Group of Institutions
Splendora 2019
Project Proposal

No: RERF/SPLENDORA2019/RP/CIVIL ENGG./02   Date:21.12.2018

1. **Department:** Civil Engineering

2. **Title:** Hydraulic Traffic Reduce System

3. **Problem Statement:**

   Category (Software / Hardware / Both): **Hardware**
   Remarks (if any):

4. **Abstract (100 Words Max):**

The project proposes an innovative Hydraulic Traffic Reduce System (HTRS) to address the growing challenges of urban traffic congestion. The system aims to optimize traffic flow by dynamically adjusting lane widths through hydraulic mechanisms based on real-time traffic data. By effectively managing traffic volume during peak hours, the project seeks to reduce travel times, vehicular emissions, and overall road congestion. The design integrates intelligent sensors, data analytics, and hydraulic actuators to ensure efficient and safe operations..

5. **Budget / Requirements:**
   Maximum Time required to complete the project (in weeks):8
   Area requirement to display the project (In Sqm): 2.25 Sqm.
   No. of students assigned (or needed to be assigned) to the project:5

6. **List of Apparatus / Instrument / Raw material:**

SL	Item Name	Item Specification/Description	Quantity
1	Hydraulic Actuators	Small-sized actuators for lane width adjustment	2
2	Control System	Basic control unit for actuator operation	1
3	Traffic Sensors	Simple proximity sensors for traffic data collection	4
4	Arduino/Raspberry Pi	Microcontroller board for data processing	1
5	Basic Construction Materials	Wood, screws, and other materials for prototyping	As required
6	Power Supply	To power the actuators and control system	1
7	Miscellaneous	Cables, connectors, and basic electrical components	As required

7. Is this an interdisciplinary project (Yes / No): Yes
8. Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No):No
9. If yes, name the other departments: NA
10. Are you collaborating with other research organisation / institutes? (Yes / No):No
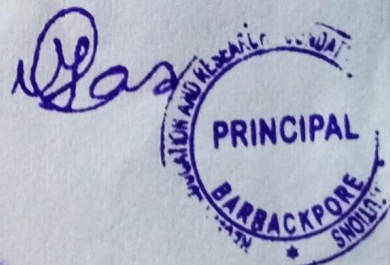11. If yes, acknowledge organisation: NA

(Signature of HOD)
Name: SATABDI SAHA
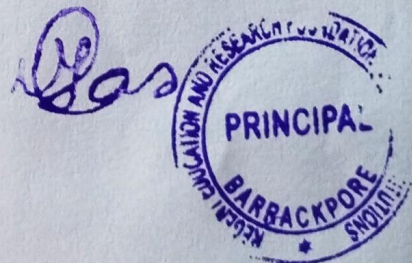
RERF Group of Institutions
Splendora 2019
Project Proposal

No: RERF/SPLENDORA2019/RP/CIVIL ENGG./04   Date:21.12.2018

1. **Department: Civil Engineering**

2. **Title: Suspension Bridge with Hydraulic Support**

3. **Problem Statement:**

   Category (Software / Hardware / Both): **Hardware**
   Remarks (if any):

4. **Abstract (100 Words Max):**

   This college-level project introduces a ground-breaking approach to bridge engineering by incorporating hydraulic support in a suspension bridge design. The project aims to enhance the bridge's stability and adaptability under varying load conditions and environmental factors. Through rigorous research, and physical prototyping, the system's feasibility and performance will be assessed. Hydraulic mechanisms will dynamically adjust tension in the suspension cables to counterbalance dynamic loads, providing improved safety and efficiency.

5. **Budget / Requirements:**
   Maximum Time required to complete the project (in weeks):8 weeks.
   Area requirement to display the project (In Sqm): 2.25 Sqm.
   No. of students assigned (or needed to be assigned) to the project:5

6. **List of Apparatus / Instrument / Raw material:**

SL	Item Name	Item Specification/Description	Quantity
1	Steel Cables	Thin steel cables for suspension elements	50 meters
2	Wooden Beams	For bridge deck and support structures	15 pieces
3	Hydraulic Actuators	Small-sized hydraulic actuators	4 units
4	Hydraulic Tubing	For hydraulic connections	2 meters
5	Miscellaneous	Nuts, bolts, glue, and other small items	As required

7. **Is this an interdisciplinary project (Yes / No): Yes**
8. **Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No):No**
9. **If yes, name the other departments: NA**
10. **Are you collaborating with other research organisation / institutes? (Yes / No):No**
11. **If yes, acknowledge organisation: NA**

(Signature of HOD)
Name: SATABDI SAHA

Approved

No: RERF/SPLENDORA2019/RP/CIVIL ENGG./05   Date:21.12.2018

1. **Department: Civil Engineering**

2. **Title: Rotating Bridge**

3. **Problem Statement:**

   Category (Software / Hardware / Both): **Hardware**
   Remarks (if any):

4. **Abstract (100 Words Max):**

The project presents an innovative Rotating Bridge design aimed at improving transportation efficiency and infrastructure adaptability. The project entails an in-depth exploration of rotating bridge mechanisms, structural dynamics, and control systems. Through advanced simulations and physical prototyping, the bridge's feasibility, stability, and safety will be evaluated. The Rotating Bridge concept aims to allow for swift waterway clearance and enhanced traffic flow without the need for traditional lift mechanisms.

5. **Budget / Requirements:**
   Maximum Time required to complete the project (in weeks):8 weeks.
   Area requirement to display the project (In Sqm): 2.25 Sqm.
   No. of students assigned (or needed to be assigned) to the project:5

6. **List of Apparatus / Instrument / Raw material:**

SL	Item Name	Item Specification/Description	Quantity
1	Wooden Beams	For bridge deck and rotating structure	10 pieces
2	Metal Rods	For supporting bridge structure	5 meters
3	Bearings	To facilitate smooth rotation	4 units
4	Gears	For transmitting rotational motion	2 units
5	DC Motor	To drive the bridge rotation mechanism	1 unit
6	Control Electronics	To control motor and bridge rotation	1 set
7	Miscellaneous	Nuts, bolts, glue, and other small items	As required

7. **Is this an interdisciplinary project (Yes / No): Yes**

8. **Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No):No**

9. **If yes, name the other departments: NA**

10. **Are you collaborating with other research organisation / institutes? (Yes / No):No**

11. **If yes, acknowledge organisation: NA**

(Signature of HOD)
Name: SATABDI SAHA

RERF Group of Institutions
Splendora 2019
Project Proposal

No: RERF/SPLENDORA2019/RP/CIVIL ENGG./06   Date:21.12.2018

1. **Department: Civil Engineering**

2. **Title: 4 Lane Traffic Road with Rotary**

3. **Problem Statement:**

   Category (Software / Hardware / Both): **Hardware**
   Remarks (if any):

4. **Abstract (100 Words Max):**

This project introduces a novel traffic management solution, a "4 Lane Traffic Road with Rotary," to address growing urban traffic congestion. It aims to optimize traffic flow and reduce delays by incorporating a rotary or roundabout within a 4-lane road network. Thorough research, advanced simulations, and physical prototyping will be conducted to assess the feasibility and performance of the system. The 4 Lane Traffic Road with Rotary aspires to enhance safety, reduce vehicular emissions, and improve overall traffic efficiency.
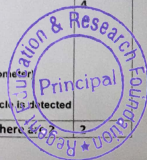
5. **Budget / Requirements:**
   Maximum Time required to complete the project (in weeks):8 weeks.
   Area requirement to display the project (In Sqm): 2.25 Sqm.
   No. of students assigned (or needed to be assigned) to the project:4

6. **List of Apparatus / Instrument / Raw material:**

SL	Item Name	Item Specification/Description	Quantity
1	Road Construction Materials	Asphalt or Concrete (for road construction)	As required
2	Road Markings	Paint or tape for lane markings	As required
3	Signage	Traffic signs for guiding vehicles	As required
4	Rotary/Roundabout Components	For physical prototype	As required
5	Miscellaneous	Nuts, bolts, glue, and other small items	As required

7. Is this an interdisciplinary project (Yes / No): Yes
8. Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No):No
9. If yes, name the other departments: NA
10. Are you collaborating with other research organisation / institutes? (Yes / No):No
11. If yes, acknowledge organisation: NA

Satabdi Saha
Approved

(Signature of HOD)
Name: SATABDI SAHA

No: RERF/SPLENDORA2019/RP/ECE/ 01

Date: 29.01.2019

1. **Department:** ECE

2. **Title:** Event Counter

3. **Problem Statement:** Now a days huge no of people visit in a shopping mall, industry etc. If any digester occurred into the area , then we can calculate how many no of peoples are exits and no of peoples present in effected area

   3.1 Category (Software / Hardware / Both): Both
   3.2 Remarks (if any):

4. **Abstract (100 Words Max):**

This project presents the design and construction of a **Event Counter**. The **Event Counter** is a reliable circuit that takes over the task of counting number of persons / visitors in the auditorium/hall/ shopping mall very accurately and beeps a warning alarm when the number of visitors exceeds the capacity limit of the auditorium/hall. When somebody enters the room then the counter is incremented by one (+1) and when any one leaves the room then the counter is decremented by one (-1). The total number of persons inside the room is also displayed on the LCD (Liquid Crystal Display).

5. **Budget / Requirements:**
   5.1 Maximum Time required to complete the project (in weeks): 4 weeks
   5.2 Area requirement to display the project (In Sqm): 1
   5.3 No. of students assigned (or needed to be assigned) to the project: 4

6. **List of Apparatus / Instrument / Raw material:**

SL	ITEM NAME	DESCRIPTION / SPECIFICATION			QUANTITY
1	Arduino uno board	ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator (CSTCE16M0V53-R0), a USB connection, a power jack, an ICSP header and a reset button			1
2	IR sensor	Working voltage	3.3 to 5V DC		4
		Operating voltage	3.3V: ~23 mA, to 5V: ~43 mA		
		Detection range	2cm – 30cm (Adjustable using potentiometer)		
		Active output level	The output is "0" (Low) when an obstacle is detected		
3	Display	A 16x2 LCD means it can display 16 characters per line and there are 2			2

	unit	such lines. In this LCD each character is displayed in 5x7 pixel matrix.	
4	Various discrete compon ent with PCB board		Adequa te

7. Is this an interdisciplinary project (Yes / No): No
8. Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No): No
9. If yes, name the other departments:
10. Are you collaborating with other research organisation / institutes? (Yes / No): No
11. If yes, acknowledge organisation:

_29.01.19_

(Signature of HOD)

Name: Mr. Pulak Mazumder

Principal

Regent Education & Research Foundation

No: RERF/SPLENDORA2019/RP/ ECE / 02

Date: 29.01.2019

1. **Department:** ECE
2. **Title:** ICT for Disable person

3. **Problem Statement: Based on stable internet connection disable person can maintain Easy life style without any barrier**
   3.1 Category (Software / Hardware / Both): Both
   3.2 Remarks (if any):

4. **Abstract (100 Words Max):**

   Google Assistant is available applications for voice controlling. This ICT system is simple and user friendly especially for Disable person . Hardware system is designed with the Arduino uno and Wi-Fi module. As the Wi-Fi connectivity is provided, the system can be controlled even from a large distance. Use of the latest technology and low cost, easy to operate system will make it accessible for every blind person

5. **Budget / Requirements:**
   5.1 Maximum Time required to complete the project (in weeks): 8 weeks
   5.2 Area requirement to display the project (In Sqm):): 0.5 Sqm
   5.3 No. of students assigned (or needed to be assigned) to the project: : 4 members

6. **List of Apparatus / Instrument / Raw material:**

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	Arduino Uno Board	ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator (CSTCE16M0V53-R0), a USB connection, a power jack, an ICSP header and a reset button	2
2	Google Assistant	Assistant USB-C headphones MUST implement physical buttons that enable the user to control Assistant functionality on the phone.	1
3	Discrete Component		adequate

7. Is this an interdisciplinary project (Yes / No): No
8. Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No): No
9. If yes, name the other departments:
10. Are you collaborating with other research organisation / institutes? (Yes / No): No
11. If yes, acknowledge organisation:

(Signature of HOD)

Name: Mr. Pulak Mazumder
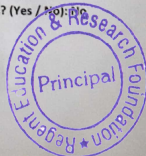
RERF Group of Institutions

Splendora 2019

Project Proposal

No: RERF/SPLENDORA2019/RP/ECE/ 03

Date: 29.01.2019

1. **Department:** ECE

2. **Title:** IOT Base Home Security System

3. **Problem Statement:** Different Type of Security measure(fire, Thief, Building Collapse etc) and information will be send to dedicated mobile number

   3.1 Category (Software / Hardware / Both): Both
   3.2 Remarks (if any):

4. **Abstract (100 Words Max):**

   In today's rapidly moving world where almost everything is driven by technology, it has become the central and essential part of living. IoT conceptualizes the idea of remotely connecting and monitoring real world objects (things) through the internet. With increasing rate of crime, protecting our loved ones and our belongings has become important. Such situations can be solved by exploiting the latest functionalities that current technology has to offer i.e. IOT which provides data communication; remote control ability makes it easier to automate the process of security.

5. **Budget / Requirements:**
   5.1 Maximum Time required to complete the project (in weeks): 8 weeks
   5.2 Area requirement to display the project (In Sqm): 0.5 Sqm
   5.3 No. of students assigned (or needed to be assigned) to the project: 5 members

6. **List of Apparatus / Instrument / Raw material:**

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	Arduino uno board	ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator (CSTCE16M0V53-R0), a USB connection, a power jack, an ICSP header and a reset button	3
2	Motion sensor	MH-SR602 MINI Motion Sensor Detector Module is used as a Pyroelectric human body infrared sensor module. This module has a sensing distance of up to 5 meters. It Can be used for body sensor lights, alarms, security.	2
3	Pizometric sensor	operate in a temperature range of approximately 20°C to +60°C. These sensors are to be kept at a temperature between -30°C to +70°C to prevent them from degradation. These sensors have very	
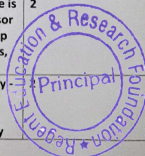
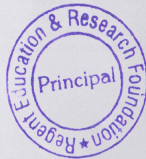# RERF Group of Institutions
Splendora 2019
Project Proposal

		low Soldering temperature. Strain sensitivity of a piezoelectric sensor is 5V/µE.	
4	Fire sensors	This sensor detects flame otherwise wavelength within the range of 760 nm – 1100 nm from the light source. This sensor can be easily damaged to high temperature.	2
5	Various discrete component with PCB board		Adequate

7. Is this an interdisciplinary project (Yes / No): No
8. Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No): No
9. If yes, name the other departments:
10. Are you collaborating with other research organisation / institutes? (Yes / No): No
11. If yes, acknowledge organisation:

_29·01·19_

(Signature of HOD)

Name: Mr. Pulak Mazumder

No: RERF/SPLENDORA2019/RP/ME/01

Date: 29|01|2019

1. **Department: Mechanical**

2. **Title:** Home Made Mini Washing Machine

3. **Problem Statement:**

   3.1 Category (Software / Hardware / Both): Hardware
   3.2 Remarks (if any): Home Made Mini Washing Machine is a low cost washing machine made up of easily and readily available scrap parts in daily life.

4. **Abstract (100 Words Max):**

Home Made Mini Washing Machine is a low cost washing machine made up of easily and readily available scrap parts in daily life. It is a machine which generates power through a servo motor and with the drive mechanism, which is required for rotary motion of the drum. Its innovation lies in its simple design, use of inexpensive parts, very low repairing and maintenance cost, affordability to each member of the society and it does not affect the environment. Our team intends to directly address the problems faced in washing clothes, and thus have developed a new design for easy effort in washing and rinsing clothes.

5. **Budget / Requirements:**
   5.1 Maximum Time required to complete the project (in weeks): 4
   5.2 Area requirement to display the project (In Sqm): 1 Sqm
   5.3 No. of students assigned (or needed to be assigned) to the project: 2

6. **List of Apparatus / Instrument / Raw material:**

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	Servo motor	To generate the rotary motion	1
2	Drums	To put the clothes and washing is done	2
3	External Power Source and water source	For power source and washing purpose	1

7. Is this an interdisciplinary project (Yes / No): No
8. Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No): No
9. If yes, name the other departments:
10. Are you collaborating with other research organisation / institutes? (Yes / No): No
11. If yes, acknowledge organisation:

(Signature of HOD)

Name: Krishnendu Mondal
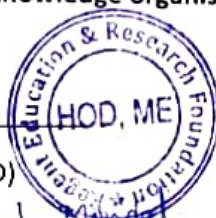
No: RERF/SPLENDORA2019/RP/ME/02

Date: 29/01/2019

1. **Department: Mechanical**

2. **Title:** Automatic Coin Counting Machine

3. **Problem Statement:**

   3.1 Category (Software / Hardware / Both): Hardware

   3.2 Remarks (if any): A coin sorter is a device which is used to sort random collection of coins into separate bins for various denominations of coins.

4. **Abstract (100 Words Max):**

   A coin sorter is a device which is used to sort random collection of coins into separate bins for various denominations of coins. Coin sorters are specific to the currency of certain countries since a different currency often distributes similarly sized coins of different value of coins. Here, four specific versions of coins have been taken and sorted according to its dimensions. The coins are inserted into a box, in which the slots are made for coins. Each coin falls in the specific slot which is detected by a Dual Channel Line Tracking Infrared Sensor.

5. **Budget / Requirements:**

   5.1 Maximum Time required to complete the project (in weeks): 4

   5.2 Area requirement to display the project (In Sqm): 0.5 sqm

   5.3 No. of students assigned (or needed to be assigned) to the project: 1

6. **List of Apparatus / Instrument / Raw material:**

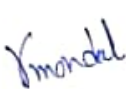| SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	Card Board	For body	Reqd. quantity
2	IR Sensor, Line Tracking Sensor Module, Jumper Wire & DC Connector	For sensing the coins	1 each
3	Battery&Breadboard	For power source	1 each

7. Is this an interdisciplinary project (Yes / No): No
8. Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No): No
9. If yes, name the other departments:
10. Are you collaborating with other research organisation / institutes? (Yes / No): No
11. If yes, acknowledge organisation:

(Signature of HOD)

(Signature of HOD)

Name: Krishnendu Mandal

No: RERF/SPLENDORA2019/RP/ME/03

Date: 29/01/2019

1. **Department: Mechanical**

2. **Title:** Unmanned Multi-Purpose Surface Vehicle

3. **Problem Statement:**

    3.1 Category (Software / Hardware / Both): Hardware
    3.2 Remarks (if any):

4. **Abstract (100 Words Max):**

    With growing worldwide interest in commercial, scientific, and military issues associated with both oceans and shallow waters, therehas been a corresponding growth in demand for the development of unmanned surface vehicles (USVs) with advanced guidance,navigation, and control(GNC)capabilities.

5. **Budget / Requirements:**
    5.1 Maximum Time required to complete the project (in weeks): 12
    5.2 Area requirement to display the project (In Sqm): 0.5-1 sqm
    5.3 No. of students assigned (or needed to be assigned) to the project:2

6. **List of Apparatus / Instrument / Raw material:**

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	Hull and auxiliary structural elements	Rigid inflatable hulls are suitable for military applications primarily because of their greater en-durance and payload capacity.	Reqd. Quantity
2	Propulsion and power system	Heading and speed control of most existing USVs are provided by rudder andpropeller (or water jet) propulsion systems	Reqd. Quantity
3	Communication systems:	Communication systems includenot only wireless communication with ground control stations and other vehicles to perform cooperative control	Reqd. Quantity
4	Data collection equipment	Together with the above-mentioned components, IMUs and GPS as the basic sensors are typically used in combination with the systemto guarantee the USV remains in good operating condition	Reqd. Quantity
5	Ground station	Ground station also plays an importantrole in USV GNC, which can be located in an onshorefacility, a mobile vehicle or an offshore ship.	Reqd. Quantity

7. Is this an interdisciplinary project (Yes / No): No
8. Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No): No
9. If yes, name the other departments:
10. Are you collaborating with other research organisation / institutes? (Yes / No): No
11. If yes, acknowledge organisation:

(Signature of HOD)

Name: Krishnendu Mondal

No: RERF/SPLENDORA2019/RP/CSE/01

Date:16/01/2019

1. **Department:**CSE

2. **Title:**Gaming Application

3. **Problem Statement:**

   3.1 Category (Software / Hardware / Both):BOTH
   3.2 Remarks (if any):

4. **Abstract (100 Words Max):**

The Gaming Application is an innovative and immersive digital platform that revolutionizes the world of interactive entertainment. Designed to captivate users of all ages and interests, this gaming application offers a diverse array of thrilling experiences, pushing the boundaries of gameplay, graphics, and interactivity. Combining cutting-edge technology with creative storytelling, it delivers an unparalleled gaming adventure that keeps players engaged and enthralled.

5. **Budget / Requirements:**
   5.1 Maximum Time required to complete the project (in weeks): 4
   5.2 Area requirement to display the project (In Sqm):04
   5.3 No. of students assigned (or needed to be assigned) to the project:8

6. **List of Apparatus / Instrument / Raw material:**
   HARDWARE COMPONENTS:

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	Computing Devices	These include servers, workstations, or cloud-based infrastructure to host the gaming application and support the backend operations.	4
2	Memory (RAM)	Sufficient RAM is required to store and process data during gameplay and ensure smooth performance.	5
3	Storage	High-speed and ample storage is necessary to store game files, assets, and player data.	5

RERF Group of Institutions
Splendora 2019
Project Proposal

SOFTWARE COMPONENTS:

4	Game Engine	The game engine is the core software that provides the framework for developing and running the games.	4
5	Graphics Libraries	Graphics libraries and APIs (e.g., DirectX, OpenGL, Vulkan) enable the game engine to communicate with the GPU and render the graphics.	6
6	Artificial Intelligence (AI)	AI algorithms may be employed to create intelligent non-player characters (NPCs), opponent AI, or dynamic game elements.	5

7. Is this an interdisciplinary project (Yes / No): YES

8. Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No): NO

9. If yes, name the other departments:

10. Are you collaborating with other research organisation / institutes? (Yes / No):NO

11. If yes, acknowledge organisation:

(Signature of HOD)

Name: SUBHANKAR GHOSH

HOD

Department of Computer Science and Engineering

Regent Education & Research Foundation

Barrackpore, Kolkata - 3 121

College Code - 3

Principal

1. **Department:**CSE

2. **Title:Robotic Hand**

3. **Problem Statement:**

    3.1 Category (Software / Hardware / Both):
    3.2 Remarks (if any):

4. **Abstract (100 Words Max):**
    The Robotic Hand represents a remarkable breakthrough in the field of robotics and human-machine interaction. Inspired by the intricacies and versatility of the human hand, this cutting-edge robotic technology strives to replicate human-like dexterity and tactile feedback while offering a wide array of applications across multiple industries.

5. **Budget / Requirements:**
    5.1 Maximum Time required to complete the project (in weeks): 4
    5.2 Area requirement to display the project (In Sqm): 120
    5.3 No. of students assigned (or needed to be assigned) to the project: 8

6. **List of Apparatus / Instrument / Raw material:**
    HAREWARE COMPONENT:

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	Actuators	Motors, servos, or pneumatic actuators are used to drive the fingers and joints of the robotic hand, allowing it to mimic human hand movements.	4
2	Sensors	Various sensors, such as force sensors, tactile sensors, and position sensors, are integrated into the robotic hand to provide feedback on grip force, finger position, and the sense of touch.	5
3	Power Supply	The robotic hand requires a reliable power supply, which can be in the form of batteries or a dedicated power source, to drive the actuators and power the electronic components.	4

SOFTWARE COMPONENTS:

4	Control Algorithms	Advanced control algorithms are developed to interpret sensor data and generate precise commands for the actuators, enabling accurate and smooth hand movements.	4
5	Human-Machine Interface (HMI)	The HMI software allows users to interact with the robotic hand through a user-friendly interface, enabling them to control hand movements, grip strength, and other functionalities.	3
6	Programming Environment	Software tools and programming environments are used to develop and debug the robotic hand's control software and algorithms.	2

7. Is this an interdisciplinary project (Yes / No): YES
8. Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No): NO
9. If yes, name the other departments:
10. Are you collaborating with other research organisation / institutes? (Yes / No): NO
11. If yes, acknowledge organisation:

_S. hr_

(Signature of HOD)

Name: SUBHANKAR GHOSH

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Principal

RERF Group of Institutions
Splendora 2019
Project Proposal

No: RERF/SPLENDORA2019/RP/CSE/PP/03

Date:*17/01/2019*

1. Department:CSE

2. Title:Robotic Car with Edge Detection

3. Problem Statement:

   3.1 Category (Software / Hardware / Both):Both
   3.2 Remarks (if any): Robotic cars equipped with edge detection capabilities offer significant advantages in terms of safety, autonomy, and efficiency.

4. Abstract (100 Words Max):The integration of edge detection capabilities in robotic cars has emerged as a critical technology for advancing autonomous driving and enhancing road safety. Edge detection, a fundamental computer vision technique, enables the robotic car to perceive and interpret the boundaries of objects and obstacles in its environment. This information is vital for making real-time decisions on navigation, lane keeping, and obstacle avoidance. This abstract discusses the significance and benefits of robotic cars equipped with edge detection capabilities. It highlights how edge detection enhances the safety and reliability of autonomous vehicles by providing a comprehensive understanding of the surroundings and enabling prompt responses to potential hazards. The adaptability of edge detection algorithms to challenging lighting and weather conditions ensures the robotic car's efficient performance in various environments.

5. Budget / Requirements:
   5.1 Maximum Time required to complete the project (in weeks): 4 Weeks
   5.2 Area requirement to display the project (In Sqm): 105
   5.3 No. of students assigned (or needed to be assigned) to the project:06

6. List of Apparatus / Instrument / Raw material:
   Software Component:

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	Camera System	High-resolution wide-angle camera(s) for capturing real-time images and video streams of the environment. Minimum resolution: 720p (HD) for clear image processing.	3
2	Sensors	Optional LIDAR sensor for additional depth perception and 3D mapping. Ultrasonic sensors for proximity detection and obstacle avoidance.	3
	Edge Detection Software	Advanced edge detection algorithms, including Canny, Sobel, or Hough Transform, for accurate identification of object edges. Preprocessing filters for noise reduction, contrast enhancement, and image normalizatio	5

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Splendora 2019
Project Proposal

Hardware Component:

1	Camera Module	High-resolution camera sensor (minimum 720p) with adjustable focus and exposure settings. Wide-angle lens to capture a broad field of view. Interface: USB or CSI (Camera Serial Interface) for easy connectivity with processing units.	4
2	Power Supply	Input voltage: 5V DC. Power consumption: Optimized for efficient energy usage	5
3	Image Data Output	Output format: RAW or processed image data. Adjustable frame rate to suit application requirements	2

7. Is this an interdisciplinary project (Yes / No): YES
8. Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No):NO
9. If yes, name the other departments: NO
10. Are you collaborating with other research organisation / institutes? (Yes / No):NO
11. If yes, acknowledge organisation:

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No: RERF/SPLENDORA2019/RP/CSE/PP/04

Date:*17/01/2019*

1. Department:CSE

2. Title: Smart Dustbean

3. Problem Statement:

   3.1 Category (Software / Hardware / Both):Both

   3.2 Remarks (if any): If "Smart Dustbean" is a real product or concept, I recommend looking for the most up-to-date information on the internet or referring to the manufacturer's website or official product documentation for detailed remarks and reviews about the product.

4. Abstract (100 Words Max):The increasing urbanization and population growth have led to a significant rise in waste generation, posing substantial challenges for traditional waste management systems. To address this issue, we propose "Smart Dustbean," a revolutionary IoT-enabled waste management solution designed to optimize waste collection and disposal processes.SmartDustbean utilizes a network of intelligent and sensor-equipped waste bins strategically placed across urban areas. Each Smart Dustbean is equipped with sensors that can monitor fill levels, detect odor, and track the type of waste disposed of. The real-time data from these sensors are transmitted to a centralized cloud-based platform for analysis and optimization.This innovative system incorporates machine learning algorithms to predict waste generation patterns and optimize waste collection schedules. By leveraging this data-driven approach, municipal authorities and waste management companies can reduce operational costs, decrease carbon emissions, and promote a cleaner environment.

5. Budget / Requirements:
   5.1 Maximum Time required to complete the project (in weeks): 4 Weeks
   5.2 Area requirement to display the project (In Sqm): 115
   5.3 No. of students assigned (or needed to be assigned) to the project: 10

6. List of Apparatus / Instrument / Raw material:
   Software Component:

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	IoT Platform	Smart Dustbean would have a sophisticated IoT (Internet of Things) platform that connects and manages a network of intelligent waste bins. This platform would enable real-time data communication between the Smart Dustbeans and a central cloud-based server.	3
2	Sensor Data Analysis	The software would include data analytics capabilities to process the information collected by the sensors in the Smart Dustbeans. It would analyze fill levels, waste composition, odor detection, and other relevant parameters to optimize waste management processes.	5
3	Machine Learning	To predict waste generation patterns and optimize waste	4

	Algorithms	collection schedules, Smart Dustbean software would employ machine learning algorithms. These algorithms would use historical data and real-time inputs to improve waste collection efficiency and reduce operational costs.	

Hardware Component:

1	Microcontroller or Processor	An energy-efficient microcontroller or processor capable of handling various tasks and running the necessary software.	3
2	Smart	This suggests that the device is likely to have some level of intelligence, connectivity, and automation capabilities.	5
3	Dustbean	This term is not standard, so it's open to interpretation. It could refer to a small size, possibly portable or wearable, device or a product designed for cleaning or dust-related tasks.	4
4	Sensors	Depending on the intended functionality, it might have sensors like accelerometers, gyroscopes, environmental sensors (temperature, humidity, etc.), proximity sensors, or others to gather data.	6

7. Is this an interdisciplinary project (Yes / No): Yes
8. Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No):NO
9. If yes, name the other departments: NO
10. Are you collaborating with other research organisation / institutes? (Yes / No):NO
11. If yes, acknowledge organisation:

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College Code

Principal

RERF Group of Institutions
Splendora 2019
Project Proposal

1. Department: EE

2. Title: WIRELESS SOUND SYSTEM WITH LIFI TECHNOLOGY
3. Problem Statement:
   3.1 Category (Software / Hardware / Both): Hardware
   3.2 Remarks (if any): Versatile project
4. Abstract (100 Words Max):

This abstract presents a wireless sound system leveraging LiFi technology. LiFi, or Light Fidelity, uses visible light communication to transmit data wirelessly. In this system, audio data is modulated onto the light emitted by LED sources, which is received and converted back to sound by LiFi receivers integrated into audio devices. LiFi's benefits include high data transfer rates, immunity to radio frequency interference, and reduced wireless network congestion. The implementation of this wireless sound system offers a potential solution for high-quality audio streaming without the limitations of traditional radio-based wireless technologies. The abstract discusses the integration of LiFi transmitters and receivers, the sound system's performance evaluation, and potential applications in home audio, public spaces, and other audio communication environments.

5. Budget / Requirements:
   5.1 Maximum Time required completing the project (in weeks): 3
   5.2 Area requirement to display the project (In Sqm): 04
   5.3 No. of students assigned (or needed to be assigned) to the project: 5
6. List of Apparatus / Instrument / Raw material:

| SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	LiFi Transmitter	DC Input Voltage(Max)=5V AC Input Voltage(Max)=200m-Vpp Input Impedance=50Ohms Operating Temperature=5° to 35°	1
2	LiFi Receiver	DC Input Voltage(Max)=24V AC Output Voltage(Max)=200m-Vpp Output Impedance=50Ohms Operating Temperature=5° to 35°	1
3	LEDs	Voltage: 2.6-3.4 V, Current:18mA	3
4	Audio Source	10-50 Watt	1
5	Amplifier	200 W average power	1
6	Power Supply	9V	1

7. Is this an interdisciplinary project (Yes / No): Yes
8. Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No):Yes
9. If yes, name the other departments: ECE,CSE, IT
10. Are you collaborating with other research organisation / institutes? (Yes / No): NO
11. If yes, acknowledge organisation:

(Signature of HOD)

Name: Mr. Bidyut Kumar Ghosh
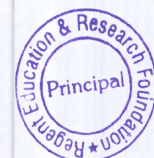
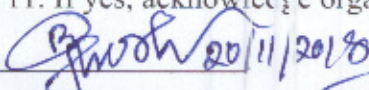No: RERF/SPLENDORA2019/RP/EE /02   Date: 20.11.2018

1. Department: EE
2. Title: AUTOMATIC DUAL AXIS SOLAR TRACKER USING ARDINO
3. Problem Statement:
   3.1 Category (Software / Hardware / Both): Both
   3.2 Remarks (if any): Versatile project
4. Abstract (100 Words Max):
   This project presents the design and development of an automatic dual-axis solar tracker using Arduino. The system aims to improve solar panel efficiency by continuously adjusting their orientation to face the sun. Light sensors, such as LDRs or photodiodes, detect sunlight intensity in two dimensions. The Arduino board calculates the sun's position using time, date, and location data, employing a sophisticated tracking algorithm. The algorithm controls the servo motors responsible for adjusting the azimuth and elevation angles of the solar panels. The system undergoes calibration for accurate sensor readings and incorporates power management strategies to ensure energy-efficient operation. Experimental results demonstrate the solar tracker's effectiveness in maximizing solar energy harvesting, making it suitable for various renewable energy applications, off-grid systems, and remote installation.
5. Budget / Requirements:
   5.1 Maximum Time required to complete the project (in weeks): 4 weeks
   5.2 Area requirement to display the project (In Sqm):
   5.3 No. of students assigned (or needed to be assigned) to the project: 1
6. List of Apparatus / Instrument / Raw material:

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	Arduino UNO	Operating Voltage:5V Input Voltage limit:6-20V SRAM:2KB Flash Memory:32KB	1
2	Solar Panel	20 watt – 12 V panel,No. Of cell:36	2
3	Connecting wires		adequate
4	Servo motors	Weight:9g, Operating speed: 0.1 s/60 degree Operating voltage: 4.8 V (~5V)	1
5	LDR	Operating Temperature: -30 ~ +70 deg C Maximum Voltage: 150 Volt DC; Maximum Wattage: 100mW	4
6	Breadboard		1
7	Resistors	10k-ohm	4

7. Is this an interdisciplinary project (Yes / No): Yes
8. Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No): yes
9. If yes, name the other departments: ECE,CSE
10. Are you collaborating with other research organisation / institutes? (Yes / No): NO
11. If yes, acknowledge organisation:

(Signature of HOD)

Name: Mr. Bidyut Kumar Ghosh
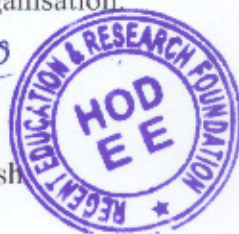
No: RERF/SPLENDORA2019/RP/EE/03   Date: 20.11.2018

1. Department: EE
2. Title: BOWLING MACHINE
3. Problem Statement:
   3.1 Category (Software / Hardware / Both):Hardware
   3.2 Remarks (if any): Versatile project

4. Abstract (100 Words Max):

A bowling machine is an essential tool in cricket training, revolutionizing the way players develop their bowling skills This abstract explores the significance and features of bowling machines. It discusses how these mechanical devices replicate bowling actions with precision, allowing players to practice under controlled conditions and enhance their techniques. The abstract emphasizes the machine's adaptability for different skill levels, accommodating beginners and professionals alike. It also delves into the various benefits, including improved accuracy, consistency, and the ability to develop diverse bowling styles. With its transformative impact on cricket training, the bowling machine plays a crucial role in shaping players' performance, ultimately contributing to better team competitiveness and overall game quality.

5. Budget / Requirements:
   5.1 Maximum Time required to complete the project (in weeks): 4
   5.2 Area requirement to display the project (In Sqm): 0.4
   5.3 No. of students assigned (or needed to be assigned) to the project: 4
6. List of Apparatus / Instrument / Raw material:

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	Frame		adequate
2	Lamp	12 V	3
3	Motors	1000 watt	1
4	Ball-throwing Mechanism	100 watt	1
5	Ball Feeder	200 watt	4
6	Control Pane	10 watt	1
7	Wheels		4
8	Power Source	500 watts	1

7. Is this an interdisciplinary project (Yes / No): Yes
8. Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No): yes
9. If yes, name the other departments: EEE
10. Are you collaborating with other research organisation / institutes? (Yes / No): NO
11. If yes, acknowledge organisation:

(Signature of HOD)

Name: Mr. Bidyut Kumar Ghosh

RERF Group of Institutions
Splendora 2019
Project Proposal

No: RERF/SPLENDORA2019/RP/EEE/01

Date: 20.11.2018

1. Department: EEE
2. Title: LDR CIRCUIT WITH LAMP
3. Problem Statement:
   3.1 Category (Software / Hardware / Both):Hardware
   3.2 Remarks (if any): Versatile project

4. Abstract (100 Words Max):

This abstract introduces a Light Dependent Resistor (LDR) circuit with a lamp, aiming to create an automatic light control system. The LDR, a photosensitive sensor, detects ambient light intensity. When the surrounding light level decreases, the LDR's resistance rises, triggering the circuit to activate a lamp. Conversely, in bright conditions, the LDR's low resistance causes the lamp to turn off. The design includes a simple transistor or relay switch to control the lamp's power. This circuit finds application in energy-efficient lighting solutions, such as streetlights, outdoor garden lamps, or indoor automatic lighting systems. The abstract discusses the circuit's working principle, its benefits in energy conservation, and potential deployment in various lighting scenarios.

5. Budget / Requirements:
   5.1 Maximum Time required to complete the project (in weeks): 2
   5.2 Area requirement to display the project (In Sqm): 0.4
   5.3 No. of students assigned (or needed to be assigned) to the project: 5

6. List of Apparatus / Instrument / Raw material:

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	LDR	Operating Temperature: -30 ~ +70 deg C Maximum Voltage: 150 Volt DC; Maximum Wattage: 100mW	1
2	LED	Forward Voltage: 1.7 - 2.2V	5
3	NPN Transistor	Collector current:10 mA Gain of high DC:80 V_{CE} : 40V V_{CB} : 60V	3
4	Resistor	10, 1K,10K ohm	3
7	Enclosure (Optional)	Material: Plastic, metal, or other suitable materials.	adequate

7. Is this an interdisciplinary project (Yes / No): Yes
8. Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No): yes
9. If yes, name the other departments: EEE,CSE, IT
10. Are you collaborating with other research organisation / institutes? (Yes / No): NO
11. If yes, acknowledge organisation:

(Signature of HOD)

Name: Mr. Suman Kumar D

RERF Group of Institutions
Splendora 2019
Project Proposal

No: RERF/SPLENDORA2019/RP/EEE /02

Date: 20.11.2018

1. Department: EEE
2. Title: BI-PEDEL ROBOT
3. Problem Statement:
   3.1 Category (Software / Hardware / Both):Hardware
   3.2 Remarks (if any): Versatile project
4. Abstract (100 Words Max):

Bipedal robots, also known as bipeds, are sophisticated machines designed to imitate the walking patterns of humans. These robots have seen remarkable advancements in recent years, driven by breakthroughs in artificial intelligence, materials, and control systems. Their applications span a wide range of fields, from research and exploration to industry and entertainment. Bipedal robots are being developed for various purposes, such as disaster response, where they can navigate complex terrains and aid in rescue missions. Additionally, they find utility in healthcare, serving as rehabilitation tools for individuals with mobility challenges. In industries, bipedal robots have potential applications in warehouses, enhancing order fulfilment efficiency.

These machines continuously evolve, with engineers working on improving their stability, adaptability, and energy efficiency. Nevertheless, challenges persist, including balance and coordination during dynamic movements. As technological progress continues, bipedal robots will undoubtedly play an increasingly significant role in shaping the future of robotics and automation.

5. Budget / Requirements:
   5.1 Maximum Time required to complete the project (in weeks): 4
   5.2 Area requirement to display the project (In Sqm): 0.4
   5.3 No. of students assigned (or needed to be assigned) to the project: 5

6. List of Apparatus / Instrument / Raw material:

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	Material alloys		Few
2	Carbon fibre		Some
3	Jumper wires		Some
4	Servo Motors	5V, 12V, 24V	3
5	Sensors	5 volts	1
6	Actuators		1
7	Wheels or Feet Materials		4
8	Cabling and Wiring		Few

7. Is this an interdisciplinary project (Yes / No): Yes
8. Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No): yes
9. If yes, name the other departments: EEE, CSE, IT
10. Are you collaborating with other research organisation / institutes? (Yes / No): NO
11. If yes, acknowledge organisation:

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