Ref: RERF/R&D/Grant/2019-20/Jan/01   Date:21/01/2020

SANCTION LETTER

To,
The HoD (All Dept.)
RERF,
Barrackpore.

Sub: Disbursement of Grant for preparing Technical Project - Splendora 2020

Sir/Madam,

It is for the information of all the Head of the Department that on approval of R& D Cell a sum of **Rs. 47000/-** has been sanctioned by the College Authority for the fabrication/ preparation of Technical Model for display in the **Splendora 2020.**
The detailed list mentioning the amount allotted for each department is given below:

Sl. No	Name of The Project	Department	Amount Sanctioned
1	HYDRAULIC BRIDGE	CE	2000
2	EARTHQUAKE RESISTANT BUILDING	CE	2500
3	RAIN WATER HARVESTING	CE	2800
4	UNDER WATER HIGHWAY TUNNEL	CE	2400
5	WATER TREATMENT PLANT	CE	2300
6	Unmanned Mini Submarine	ME	3500
7	Economic Coffee Vending Machine	ME	1500
8	Mini Vacuum Cleaner from Recycle Materials	ME	1000
9	Bio fuel from Plastic Waste	ME	2000

Campus : **Regent Education & Research Foundation Group of Institutions**
E-mail : **rerfkolkata@gmail.com**, Website : **www.rerf.in**

Campus Address:
Bara Kanthalia, Barrackpore
P.O: Sewli Telinipara, P.S.: Titagarh
Kolkata - 700 121
Tel.: 033-3008-5442/432/431, Fax: 033-3008-5442

*Regd. Office Address***:**
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7th Floor, Kolkata - 700 017
Tel.: 033-3221-3013

10	Mobile Controled Car	CSE	3000
11	Auto-Obstructive Sensitive 4 Wheeler	CSE	3000
12	Face & Emotion Detection	CSE	3000
13	Trishul	ECE	1500
14	Brain wave control Home Applience	ECE	2500
15	ECO FRIDGE	EE	4500
16	OBSTRUCTION DETECTOR	EE	3000
17	TRAIN REPULSION WITH MAGNETIC ENERGY	EE	2000
18	SMART DUSTBIN	EEE	1500
19	RADAR SYSTEM	EEE	1000
20	TESLA COIL	EEE	2000

_____
Principal
RERF

Campus : **Regent Education & Research Foundation Group of Institutions**
E-mail : rerfkolkata@gmail.com, Website : www.rerf.in

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RERF Group of Institutions
Splendora 2020
Project Proposal

No: RERF/SPLENDORA2020/RP/CIVIL ENGG./01   Date: 18.12.2019

1. **Department:** Civil Engineering

2. **Title:** Rain water harvesting

3. **Problem Statement:**

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

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

   Rainwater harvesting is an important environment friendly approach – "Green Practice" which has double benefit in both keeping the groundwater table undisturbed and charging the aquifer. Such green practice encourage in form of Community Development Program to save earth by achieving nobler feelings saving water for future in one hand; on the other hand, rainwater as well as run-off storm water stored in a planned way save the earth from soil erosion, flood; recharge the aquifers to give a shot in the arm to the decreasing groundwater table.

5. **Budget / Requirements:**
   Maximum Time required to complete the project (in weeks):08
   Area requirement to display the project (In Sqm):2.25 Sqm
   No. of students assigned (or needed to be assigned) to the project:6

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

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1.	Cardboard	For support	2
2.	Levelling Pipe		
3.	Plastic Containers	Round and rectangular shape	3
4.	Coloured paper	Art paper and butter paper	7
5	Pebbles	For filtration process	65
6	Artificial grass (optional)	60cmx40cm	1
7	Hot glue		1

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: Not applicable
10. Are you collaborating with other research organisation / institutes? (Yes / No):No
11. If yes, acknowledge organisation: No

Satabdi Saha

(Signature of HOD)

Name: SATABDI SAHA

RERF Group of Institutions
Splendora 2020
Project Proposal

No: RERF/SPLENDORA2020/RP/CIVIL ENGG./02   Date: 18.12.2019

1. **Department:** Civil Engineering

2. **Title:** Hydraulic Bridge

3. **Problem Statement:**
   Category (Software / Hardware / Both): Hardware
   Remarks (if any): Model

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

   Hydraulic bridge also known as "moving bridge" is a bridge that is used to allow seaside traffic through a body of water. In short, it can be moved to allow the passage for boats or ships. The bridge design incorporates an integrated hydraulic system into the bridge in order to carry more weight.

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	DESCRIPTION / SPECIFICATION	QUANTITY
1.	Cardboard	For support	1
2.	Syringes	For Hydraulic suction	4
3.	Medical Pipe		6
4	Hot glue		1
5	Colour Paper	For colouring	1
6	Knife		1
7	Scale		1
8	Scissor		1
9	Diy- mat		1

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: Not applicable
10. Are you collaborating with other research organisation / institutes? (Yes / No):No
11. If yes, acknowledge organisation: No

Satabdi Saha

_____
(Signature of HOD)

Name: SATABDI SAHA

RERF Group of Institutions
Splendora 2020
Project Proposal

No: RERF/SPLENDORA2020/RP/CIVIL ENGG./03

Date:18.12.2019

1. **Department:** Civil Engineering

2. **Title:** Earthquake resistant building

3. **Problem Statement:**
   Category (Software / Hardware / Both): Hardware
   Remarks (if any): Model

4. **Abstract (100 Words Max):**
   Earthquake, any sudden shaking of the ground caused by the passage of seismic waves through Earth's rocks. Seismic waves are produced when some form of energy stored in Earth's crust is suddenly released, usually when masses of rock straining against one another suddenly fracture and "slip." Earthquakes occur most often along geologic faults, narrow zones where rock masses move in relation to one another.

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	DESCRIPTION / SPECIFICATION	QUANTITY
1.	Cardboard	For support	2
2.	Mount Board	For Building	2
3.	Spring	For Resistance	4
4.	LED lights		4
5	Electric Wire	For Connection	1 m
6	Buzzer		1
7	Hot glue		1
8	Acrylic colours	For colouring	1
9	Knife		1
10	Scale		1
11	Switch		1
12	9 volts Battery		1

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: Not applicable
10. Are you collaborating with other research organisation / institutes? (Yes / No):No
11. If yes, acknowledge organisation: No

Satabdi Saha

(Signature of HOD)

Name: SATABDI SAHA
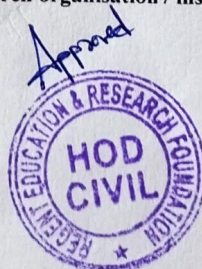
RERF Group of Institutions
Splendora 2020
Project Proposal

No: RERF/SPLENDORA2020/RP/CIVIL ENGG./04   Date:18.12.2019

1. **Department:** Civil Engineering

2. **Title:** Water treatment plant

3. **Problem Statement:**
   Category (Software / Hardware / Both): Hardware
   Remarks (if any): Model

4. **Abstract (100 Words Max):**
   A typical water treatment plant has the combination of processes needed to treat the contaminants in the source water treated by the facility. The presence of unbeatable organic or mineral substances causes some problems in obtaining drinking water. Understanding these phenomena requires taking into account the physical and chemical natures of the water to be treated.

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:7

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

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1.	Plywood	2/3 FUT PLYWOOD	1
2.	Thermocol	For Factory	2
3.	Plastic box		6
4.	LED lights		4
5	Electric Wire	For Connection	1 m
6	Colour Paper		
7	Hot glue		1
8	Acrylic colours	For colouring	1
9	Knife		1
10	Scale		1
11	PVC Pipes		4
12	Straw		10
13	Plastic trees		6-10
14	Plastic House		
15	Battery	9 VOLT	1
16	Dc water pump	9 VOLT	1
17	Battery Cap		1
18	Switch		1

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: Not applicable
10. Are you collaborating with other research organisation / institutes? (Yes / No):No
11. If yes, acknowledge organisation: No

Satabdi Saha

(Signature of HOD)

Name: SATABDI SAHA

RERF Group of Institutions
Splendora 2020
Project Proposal

No: RERF/SPLENDORA2020/RP/CIVIL ENGG./05

Date: 18.12.2019

1. **Department: Civil Engineering**

2. **Title: Under water highway tunnel**

3. **Problem Statement:**
   Category (Software / Hardware / Both): Hardware
   Remarks (if any): Model

4. **Abstract (100 Words Max):**
   An underwater tunnel is a tunnel which is partly or wholly constructed under the river. They are often used where building a bridge or operating a ferry link is unviable, or to provide competition or relief for existing bridges or ferry links. While short tunnels are often road tunnels which may admit motorized traffic, unmotorized traffic or both, concerns with ventilation lead to the longest tunnels (such as the Channel Tunnel or the Seikan Tunnel) being electrified rail tunnels.

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	DESCRIPTION / SPECIFICATION	QUANTITY
1.	Cardboard	For support	2
2.	Thermocol	For Building	2
3.	Cars		4
4.	LED lights		4
5	Electric Wire	For Connection	1 m
6	Colour Paper		
7	Hot glue		1
8	Acrylic colours	For colouring	1
9	Knife		1
10	Scale		1
11	Medical Pipes		4

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: Not applicable
10. Are you collaborating with other research organisation / institutes? (Yes / No):No
11. If yes, acknowledge organisation: No

Satabdi Saha

(Signature of HOD)

Name: SATABDI SAHA

RERF Group of Institutions

Splendora 2020

Project Proposal

No: RERF/SPLENDORA2020/RP/ECE/ 01

Date: 15.01.2020

1. **Department:** ECE
2. **Title:** Trishul
3. **Problem Statement:** Principal need of intelligence security system with technology requirement and challenges to build the system for women security . Since the prediction of such incident is not possible hence to minimize the possibility of physical violence (robbery, sexual assault etc.) by keeping all the help tools ready to safely escape from violent situation

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

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

   The main aim of this project is to implement real time women security system in public places which aims to provide the 100% safe environment .This project focuses on a security system that is designed solely to serve the purpose of providing security and safety to women so that they never feel helpless while facing such social challenges. This project describes about a smart intelligent security system for women.

5. **Budget / Requirements:**
   5.1 Maximum Time required to complete the project (in weeks): 8weeks
   5.2 Area requirement to display the project (in Sqm): 2 Sqm
   5.3 No. of students assigned (or needed to be assigned) to the project: 7 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	GSM module along with sim	GSM module and GPRS modem powered by a power supply circuit and communication interfaces (like RS-232, USB 2.0, and others) for controller . A GSM modem can be a dedicated modem device with a serial, USB, or Bluetooth connection, or it can be a mobile phone that provides GSM modem capabilities.	2
3	Discrete components		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

Scanned by CamScanner

RERF Group of Institutions

Splendora 2020

Project Proposal

No: RERF/SPLENDORA2020/RP/ECE/02

Date: 15.01.2020

1. Department: ECE
2. Title: Brain wave control Home Appliance
3. Problem Statement: The electronic sensor built into BCI headset captures and filters the raw brainwave signal which could be as Attention level (similar to concentration) and Meditation level (similar to relaxation), aided in control of home appliances (like bulb, fan), which is categorized under non-invasive method of brain signal measurement.

   3.1 Category (Software / Hardware / Both): Both

   3.2 Remarks (if any):

4. Abstract (100 Words Max):

   The project proposes an interaction between human brain and silicon brain to control the devices used in home without having any touch of muscular body part. Brain Computer Interface (BCI) is one of the communication channels to make such a direct neural interface. The electronic sensor built into BCI headset captures and filters the raw brainwave signals.

   BCI is used to send data between the human brain neural system and silicon brain system. It have presented new opportunities in efficient control of device, due to accuracy of signal being generated and received

5. Budget / Requirements:

   5.1 Maximum Time required to complete the project (in weeks): 8week

   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: 4 members

6. List of Apparatus / Instrument / Raw material:

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	Operational Amplifier (OP07)	OP07 with ±15 V supplies , and offer the further advantage of truesingle-supply operation down to V , and smaller packageoptions than any other high-voltage precision bipolar amplifier. Outputs are stable with capacitive loads of over 500 pF. Supplycurrent is less than 300 µA per amplifier at 5 V. 500 Ω series resistors protect the inputs, allowing input signal levels several volts abovethe positive supply without phase reversal	10
2	Discrete components		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:

_____ 15.01.20

(Signature of HOD)

Name: Mr. Pulak Mazumder

Principal

RERF Group of Institutions
Splendora 2020
Project Proposal

No: RERF/SPLENDORA2020/RP/ME/01

Date: 16/01/2020

1. **Department:** Mechanical

2. **Title:** Unmanned Mini Submarine

3. **Problem Statement:**

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

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

   It's a vehicle that can operate underwater without a human occupant. It is a subclass of UUVs with the primary purpose of replacing humans for underwater tasks due to the difficult underwater conditions. It is designed to perform educational or industrial missions. It is manually controlled by an operator to perform tasks that include surveillance and patrolling.

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): 3-3.5 Sqm
   5.3 No. of students assigned (or needed to be assigned) to the project: 6

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

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	Propeller	Use for Propulsion	1
2	Motor	To rotate the propeller	1
3	Battery	Power source for motor and internal circuit	2
4	UNO circuit and remote controller	To control the vehicle remotely	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
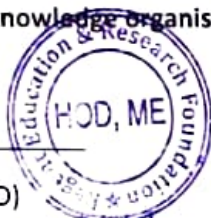
RERF Group of Institutions
Splendora 2020
Project Proposal

No: RERF/SPLENDORA2020/RP/ME/02   Dates: 16/01/2020

1. **Department: Mechanical**

2. **Title: Economic Coffee Vending Machine**

3. **Problem Statement:**

   3.1 Category (Software / Hardware / Both): Hardware
   3.2 Remarks (if any): A machine that dispenses coffee when a Coin is inserted.

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

   The aim of this project is to cater to the specific requirement of the consumer especially of small scale sector with the intention of providing the consumer with the option of coffee and also providing them option to select a suitable reservoir of water such as a 1 litre mineral water bottle thereby moving a step further of the machines which are available in the market for small scale organisations/industries/offices with very low cost compare to other vending machines available in market.

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: 3

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

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	Servo Motor	rotary actuator or linear actuator that allows for precise control of angular or linear position, velocity and acceleration	1
2	Arduino Uno Microcontroller	It contains everything needed to support themicrocontroller	1
3	Water Heating Unit	Water Heating Element, Cut-off Thermostat, Solenoid Valve	1
4	Container & Appliance Body	Mild Steel sheet for body and food grade plastic or food grade steel for the container	2

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 Mandal

RERF Group of Institutions
Splendora 2020
Project Proposal

No: RERF/SPLENDORA2020/RP/ME/03

Date: 16|01|2020

1. **Department:** Mechanical

2. **Title:** Mini Vacuum Cleaner from Recycle Materials

3. **Problem Statement:**

   3.1 Category (Software / Hardware / Both): Hardware

   3.2 Remarks (if any): Homemade vacuum cleaner with using recycled plastic bottles

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

   We are trying to make homemade vacuum cleaner with using recycledplastic bottles by our own invention it would lessen expenses. And it could saveour daily budget because the materials that we are using in this product arelessening of using expensive materials. And we can save our Mother Nature by using recycled plastic waste which is harmful for our nature.

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: 2

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

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	Recycle plastic bottles	For the body	1
2	Electric battery	For power source	1
3	Computer fan	For creating the vacuum effect	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: Krishmendu Mistri

HOD, ME

Principal

No: RERF/SPLENDORA2020/RP/ME/04

Date: 16/01/2020

1. **Department:** Mechanical

2. **Title:** Bio fuel from Plastic Waste

3. **Problem Statement:**

   3.1 Category (Software / Hardware / Both): Hardware

   3.2 Remarks (if any):

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

   Waste plastic is abundant and its disposal creates largeproblems for the environment. Plastic does not break down in landfills, it is noteasily recycled and degrades in quality during the recycling process, and it canproduce waste ash, heavy metals, and potentially harmful gas emissions ifincinerated at high temperatures. However, thermal processes can be used toconvert plastics into hydrocarbon fuels such as gasoline, diesel, aviation / jet fuel,which have unlimited applications in airline industries, helicopter, heavytransportation, and electricity generation.

5. **Budget / Requirements:**

   5.1 Maximum Time required to complete the project (in weeks): 8

   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	Polypropylene (PP) Homopolymer	Raw material used for extracting oil by the process of Pyrolysis	Not specific
2	Gas, Burner & Furnace	Used as Reactor	1 each
3	Counter flow condenser	To cool down the gas	1
4	Separation Chamber	To store the liquefied gas	1
5	Collection Tank	To store the final product	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

HOD, ME

No: RERF/SPLENDORA2020/RP/CSE/PP/01

Date: 15/01/2020

1. **Department:** CSE
2. **2.Title:** Mobile Controlled Car

3. **3 . Problem Statement:**

   3.1 Category (Software / Hardware / Both):Both

   3.2 1.2 Remarks (if any): Wireless is one of most prominent technology that is used in different industries that actually save our cost. During this project we got familiar with different use cases of wireless technology. Most important thing was that we got to know about Arduino Hardware part as well as Software part. Different types of Arduino are used. The main conclusion is that Bluetooth module has its limited range. if we go > 100 it gets automatically disconnected. The instructions from Android Application are given to microcontroller via Bluetooth Module. Microcontroller processes that instruction within fraction of second it will send to Motor Driver so that motor can rotate thus it has given different movement results.

4. **Abstract (100 Words Max):** The mobile-controlled car is a fascinating project that combines hardware and software elements to create a remotely operated vehicle. This project aims to design and build a car that can be controlled wirelessly from a mobile device through a dedicated mobile app. The car's primary components include motors, a microcontroller, a Bluetooth module, and a chassis.
The hardware setup involves selecting appropriate DC motors or geared motors for driving the wheels, along with wheels compatible with the motors and chassis. A motor driver or controller is used to control the direction and speed of the motors. A microcontroller, such as an Arduino or Raspberry Pi, is employed to interface with the mobile app and process control commands. In conclusion, the mobile-controlled car project is an engaging and educational endeavour, providing a platform to explore electronics and programming concepts while creating a versatile and fun remote-controlled vehicle. It fosters problem-solving abilities and innovation, making it an ideal project for hobbyists, students, and enthusiasts alike.

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

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

RERF Group of Institutions
Splendora 2020
Project Proposal

Hardware Component:

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	Chassis	The base structure of the car where all other components are mounted. You can choose a 2-wheel or 4-wheel chassis depending on your design preferences.	1
2	Wheels	Choose wheels that are compatible with the motors and chassis. Different types of wheels are available for different terrains and applications.	3
3	Motor	DC motors or geared motors are commonly used for driving the wheels. The specifications depend on the weight of your car and the desired speed. For example, 100 RPM motors are a common choice.	1

Software Component:

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	Mobile App	Platform: Android or iOS (or both, depending on your target devices). Programming Language: Java or Kotlin for Android, Swift for iOS.	2
2	Microcontroller Embedded Software	Platform: Arduino or Raspberry Pi (or other microcontroller platforms, depending on your chosen microcontroller). Programming Language: C or C++ for Arduino, Python for Raspberry Pi (though other languages may also be used).	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:

S.W

(Signature of HOD)
Name: SUBHANKAR GHOSH
HOD
Department of Computer Science and Engineering
Regent Education Research Foundation
Barrackpore, Kolkata - 700 121
College Code - 263

Principal

RERF Group of Institutions
Splendora 2020
Project Proposal

No: RERF/SPLENDORA2020/RP/CSE/PP/02

Date:15/01/2020

1. Department:CSE

2. Title:Auto-Obstructive Sensitive 4 Wheeler

3. Problem Statement:

   3.1 Category (Software / Hardware / Both): BOTH
   3.2 Remarks (if any): The concept of the Auto-Obstructive Sensitive 4 Wheeler is undoubtedly intriguing and addresses a critical aspect of road safety.

4. Abstract (100 Words Max):

The Auto-Obstructive Sensitive 4 Wheeler is an innovative advancement in the automotive industry aimed at enhancing road safety and mitigating potential accidents caused by various road hazards. This novel 4-wheeled vehicle incorporates cutting-edge technology and intelligent systems to autonomously detect, analyse , and respond to obstructive objects on the road, ensuring a safer and more secure driving experience.

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: 6

6. List of Apparatus / Instrument / Raw material:

HARDWARE COMPONENTS:

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	LIDAR	LIDAR sensors use laser beams to create detailed 3D maps of the vehicle's surroundings, accurately measuring distances to objects and detecting obstacles in real-time.	4
2	RADAR	RADAR sensors complement the LIDAR by using radio waves to detect and track objects, especially those at longer distances and in adverse weather conditions.	3
3	Ultrasonic Sensors	Ultrasonic sensors are commonly used for short-range object detection, especially in parking and low-speed maneuvering situations.	6

Principal

SOFTWARE COMPONENTS:

4	Artificial Intelligence (AI) System	The AI system is at the core of the Auto-Obstructive Sensitive 4 Wheeler. It encompasses machine learning algorithms, computer vision, and decision-making modules.	5
5	Sensor Fusion Software	As the vehicle is equipped with multiple sensors (LIDAR, RADAR, cameras, ultrasonic sensors), sensor fusion software is essential.	4

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.W____

(Signature of HOD)

Name: SUBHANKAR GHOSH

HOD
Department of Computer Science and Engineering
Regent Education & Research Foundation
Barrackpore, Kolkata - 700 121
College Code

RERF Group of Institutions
Splendora 2020
Project Proposal

No: RERF/SPLENDORA2020/RP/CSE/PP/03   **Date:**15/01/2020

1. Department:CSE

2. Title:Face & Emotion Detection

3. Problem Statement:

   3.1 Category (Software / Hardware / Both):Both
   3.2 Remarks (if any):
   Face and emotion detection are fascinating and valuable technologies that have seen significant advancements in recent years. These technologies fall under the broader domain of computer vision and artificial intelligence.

4. Abstract (100 Words Max):
   Face and emotion detection are significant areas in the field of computer vision and artificial intelligence. This paper presents an overview of the advancements and challenges in face and emotion detection technologies.
   The first part of the paper focuses on the importance and applications of face and emotion detection in various industries. From security and surveillance to healthcare and entertainment, these technologies have found diverse use cases that benefit society and businesses.
   The second section delves into the technical aspects of face and emotion detection. Deep learning techniques, particularly convolutional neural networks (CNNs), have revolutionized these tasks by learning complex features from facial images. The paper discusses the architecture and training methodologies of CNNs, highlighting their contributions to accurate and real-time face and emotion recognition.
   Furthermore, the paper explores the challenges faced by face and emotion detection algorithms. Handling diverse facial appearances, expressions, and cultural variations present significant hurdles. Researchers are working on developing robust models that generalize well across different demographics.

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): 130
   5.3 No. of students assigned (or needed to be assigned) to the project:3

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

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
	OpenCV	OpenCV is a widely used open-source computer vision library that provides functions for face detection, facial landmark detection, and basic emotion recognition.	1
	Face API (Microsoft	Microsoft Azure's Face API is a cloud-based service that offers face detection and emotion	3
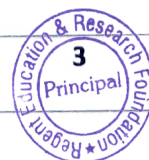
	Azure)	functionalities through REST APIs.	
	Face++ (Megvii)	Face++ is a cloud-based platform that provides face detection and emotion recognition services using APIs.	2

Hardware Component:

Face Detection	Real-time face detection with high accuracy and robustness. Support for detecting multiple faces in images and video streams.		2
Privacy and Security	Compliance with data protection and privacy regulations. Option for on-device processing to ensure user data privacy.		1
Customization and Fine-Tuning	Flexibility to fine-tune pre-trained models for specific use cases. Support for adding custom emotions or extending the emotion recognition model		4

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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Name: SUBHANKAR GHOSH

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RERF Group of Institutions
Splendora 2020
Project Proposal

No: RERF/SPLENDORA2020/RP/EE/01

Date: 13.11.2019

1. Department: EE
2. Title: ECO FRIDGE
3. Problem Statement:
   3.1 Category (Software / Hardware / Both): Hardware
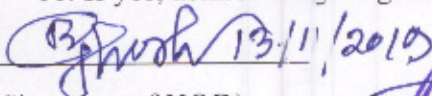   3.2 Remarks (if any): versatile
4. Abstract (100 Words Max):

The Eco Fridge is a revolutionary appliance designed to minimize energy consumption and reduce its environmental impact. This innovative refrigerator employs cutting-edge technologies to optimize cooling efficiency while utilizing eco-friendly refrigerants with low global warming potential. Its state-of-the-art insulation and smart sensors ensure precise temperature regulation, resulting in reduced energy wastage. Additionally, the Eco Fridge incorporates features like LED lighting and energy-saving modes to further enhance efficiency.

By promoting sustainable practices, the Eco Fridge aims to combat climate change and support a greener future. Its design emphasizes recyclable materials, and the manufacturing process adheres to stringent eco-friendly standards, reducing its carbon footprint. Consumers can rest assured that by choosing the Eco Fridge, they are making a conscious choice towards environmental preservation without compromising on performance and functionality. With its environmentally conscious engineering, the Eco Fridge sets a new standard for responsible cooling solutions in today's world.

5. Budget / Requirements:
   5.1 Maximum Time required to complete the project (in weeks): 3
   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: 6
6. List of Apparatus / Instrument / Raw material:

| SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	Recycled steel and aluminium		Few
2	Natural refrigerants		Few
3	Energy-efficient compressors and motors		3
4	Recycled plastics:		Some
5	LED lighting	3, 15 watt	2
6	Energy-saving electronics		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: Mr. Bidyut Kumar Ghosh
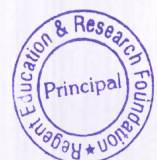
No: RERF/SPLENDORA2020/RP/EE /02   Date: 13/11/2019

1. Department: EE
2. Title: OBSTRUCTION DETECTOR
3. Problem Statement
   3.1 Category (Software / Hardware / Both): Hardware
   3.2 Remarks (if any): versatile
4. Abstract (100 Words Max):

An obstruction detector is a sophisticated device designed to identify and alert users about potential obstacles or obstructions in each area. It utilizes advanced sensors, such as infrared, ultrasonic, or radar technology, to scan the surroundings continuously. When an obstruction is detected within the predefined range, the detector triggers an alarm or warning signal, notifying users of the potential danger. Obstruction detectors find applications in various domains, including automotive safety systems, industrial machinery, robotics, and home security. In the automotive industry, obstruction detectors aid in collision avoidance by alerting drivers to objects or pedestrians in their blind spots. In industrial settings, these detectors contribute to worker safety by preventing accidents with heavy machinery. Additionally, in smart homes, obstruction detectors play a vital role in ensuring the security of occupants and assets. The efficiency and accuracy of obstruction detectors make them indispensable tools for enhancing safety and preventing accidents in a wide range of environments.

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

SL	ITEM NAME	DESCRIPTION / SPECIFICATION	QUANTITY
1	IR Sensor	Operating Voltage: 3.6 - 5V , Average Current consumption : 0.06 mA Distance Measuring Range : 2-30 cm	1
2	Arduino UNO	Operating Voltage: 5V Input Voltage limit: 6-20V SRAM: 2KB Flash Memory: 32KB	1
3	Resistor	220, 100.10K,1K Ohm	5
4	Display and Interface		1
5	USB Cable		1
6	Bread Board		1
7	Buzzer and LED		2
8	Jumper wires		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:

RERF Group of Institutions
Splendora 2020
Project Proposal

(Signature of HOD)
Name:Mr. Bidyut Kumar Ghosh

RERF Group of Institutions
Splendora 2020
Project Proposal

No: RERF/SPLENDORA2020/RP/EE /03

Date: *13/11/2019*

1. Department: EE
2. Title: TRAIN REPULSION WITH MAGNETIC ENERGY
3. Problem Statement:
   3.1 Category (Software / Hardware / Both): Hardware
   3.2 Remarks (if any): versatile
4. Abstract (100 Words Max):

Train repulsion with magnetic energy is an innovative concept aimed at revolutionizing transportation systems through magnetic levitation (Maglev) technology. This paper explores the principles and applications of magnetic repulsion in the context of high-speed train propulsion. Maglev trains utilize powerful magnets to levitate above the tracks, eliminating the need for physical contact and reducing friction, resulting in minimal energy loss during travel. The paper examines the underlying principles of electromagnetic repulsion, including magnetic fields, polarity, and stability. It discusses the advantages of Maglev technology, such as faster speeds, lower maintenance, and reduced environmental impact compared to conventional rail systems. Additionally, the paper delves into the challenges and considerations of implementing Maglev trains on a larger scale. The study highlights the potential of train repulsion with magnetic energy to create a sustainable, efficient, and futuristic transportation system.

5. Budget / Requirements:
   5.1 Maximum Time required to complete the project (in weeks): 3
   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	Superconducting Magnets	20 Tesla	Few
2	Superconducting Wire		Some
3	Cryogenic Cooling Systems	110V	1
4	Track and Guide way Materials		Few
5	Power Electronics and Control Systems		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: Mr. Bidyut Kumar Ghosh

RERF Group of Institutions
Splendora 2020
Project Proposal

No: RERF/SPLENDORA2020/RP/EEE/01   Date: *13.11.2019*

1. Department: EEE
2. Title: SMART DUSTBIN USING ARDUINO
3. Problem Statement:
   3.1 Category (Software / Hardware / Both): Hardware
   3.2 Remarks (if any): versatile
4. Abstract (100 Words Max):

The automatic dustbin is an innovative solution that has transformed the traditional waste management landscape. In this era of escalating urbanization and increasing environmental concerns, efficient waste disposal has become imperative. The automatic dustbin stands as a beacon of sustainability and convenience, leveraging cutting-edge technology to optimize waste collection and disposal processes

This abstract examines the key features and functionalities of automatic dustbins, focusing on their sensor-based systems, intelligent sorting capabilities, and autonomous emptying mechanisms. With the integration of smart sensors, these bins can detect motion and proximity, enabling hands-free operation and reducing human contact with potentially hazardous waste. Furthermore, the implementation of artificial intelligence and machine learning algorithms allows automatic dustbins to classify and segregate recyclable materials, minimizing the strain on landfills and promoting recycling initiatives.

Through this abstract, we explore the potential benefits of widespread automatic dustbin adoption, including improved hygiene standards, reduced carbon footprint, and a cleaner, more sustainable environment. The study underscores the necessity of embracing advanced waste management technologies to propel our society towards a greener and eco-conscious future.

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	Arduino UNO	Operating Voltage:5V Input Voltage limit:6-20V SRAM:2KB Flash Memory:32KB	1
2	Lid		adequate
3	Microcontroller	3.3V	1
4	Ultrasonic Sensors	Operating Voltage : 5V DC Operating Current : 15mA Operating Frequency : 40KHz	3
5	Servo Motor	Operating Voltage : +5V Operating speed : 0.1s /60° Weight : 9g	1
6	Battery	1.5V (e.g., AA, AAA alkaline batteries), 3.7V (e.g., lithium-ion rechargeable batteries), and 12V (e.g., lead-acid batteries used in car batteries).	3
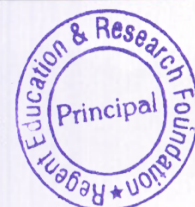
7. Is this an interdisciplinary project (Yes / No): No
8. Are you collaborating with other departments of RERF / RIST / SVIMS (Yes / No): No
9. If yes, name the other departments:

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

11. If yes, acknowledge organisation:

_____

(Signature of HOD)

Name: Mr. Suman Kumar Dey

No: RERF/SPLENDORA2020/RP/EEE/02   Date: *13.11.2019*

1. Department: EEE
2. Title: SOLID STATE TESLA COIL
3. Problem Statement:
    3.1 Category (Software / Hardware / Both): Hardware
    3.2 Remarks (if any): versatile
4. Abstract (100 Words Max):

The Tesla Coil, a revolutionary invention by Nikola Tesla in the late 19th century, has since become an iconic representation of electrical engineering's potential. This abstract presents a concise overview of the Tesla Coil, its principles, and applications.

The Tesla Coil is an air-core transformer that employs resonance to magnify high-frequency electrical currents to astonishing levels, propelling it beyond traditional transformer capabilities. Its innovative design comprises primary and secondary coils coupled with a capacitor, facilitating energy transfer through resonant frequencies. This creates awe-inspiring electrical discharges in the form of high-voltage, low-current arcs, capable of reaching incredible distances.

This abstract explores the underlying principles that govern Tesla Coil operation, including electrical resonance, electromagnetic induction, and self-oscillation. Moreover, it delves into its historical significance, applications in wireless power transmission, and its role as a captivating educational tool for understanding the fundamental laws of electricity.Top of Form

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	Power supply Unit	220-12V Transformer	1
2	Primary Coil	16 SWG,3 turns	1
3	Secondary Coil	36 SWG,800 turns	1
4	Capacitor	1000µF,25V	1
5	Resistor	22KΩ	1
6	Transistor	NPN Transistor	1
6	Diode		4
7	PVC Pipe		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. Suman Kumar Dey

RERF Group of Institutions
Splendora 2020
Project Proposal

No: RERF/SPLENDORA2020/RP/EEE/03

Date: 13.11.2019

1. Department: EEE
2. Title: RADAR SYSTEM USING ARDUINO
3. Problem Statement:
   3.1 Category (Software / Hardware / Both): Both
   3.2 Remarks (if any): versatile
4. Abstract (100 Words Max):

A RADAR (Radio Detection and Ranging) system is a sophisticated technology used to detect and track objects in the air, on the ground, or at sea. It operates on the principle of sending out radio waves and then measuring the time it takes for these waves to bounce back after hitting an object. This process allows the system to calculate the distance, direction, and speed of the detected targets. RADAR systems find extensive applications in various fields, including military, aviation, weather monitoring, and maritime navigation. Military RADARs are vital for surveillance, target identification, and missile guidance. In aviation, RADAR assists air traffic control in monitoring aircraft movements and preventing collisions. Weather RADARs track precipitation and help predict severe weather events. Maritime RADARs aid navigation, collision avoidance, and search and rescue operations at sea.

Advancements in technology have led to modern RADAR systems with increased accuracy, range, and capabilities, making them crucial tools for ensuring safety and security in various domains.

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: 4
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	Servo Motor	Weight:9g. Operating speed: 0.1 s/60 degree Operating voltage: 4.8 V (~5V)	1
3	Bread Board	2.8 KW	1
4	Ultrasonic sensor	Working Voltage:5V Static Current:<2mA Detection Distance:2 – 450cm	1
5	Connecting wire		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
Name: Mr.