

# **PORTFOLIO FOR OUTSTANDING PERFORMANCE IN INNOVATION**



**RONJAE CALVIN M.  
GREGORIO**



**ROSARIO INTEGRATED  
NATIONAL HIGH SCHOOL**





# OUTPUT (70%)

## AS SHOWN THROUGH:

- A. ORIGINALITY OR NOVELTY OF THE PRODUCT OR SERVICE.
- B. RELEVANCE, APPLICABILITY, REPLICABILITY, SUSTAINABILITY AND/OR USEFULNESS TO THE SCHOOL AND/OR LARGER COMMUNITY.
- C. COST- EFFECTIVENESS, EFFICIENCY, AND/OR PRACTICALITY.
- D. ENVIRONMENTALLY SAFE.

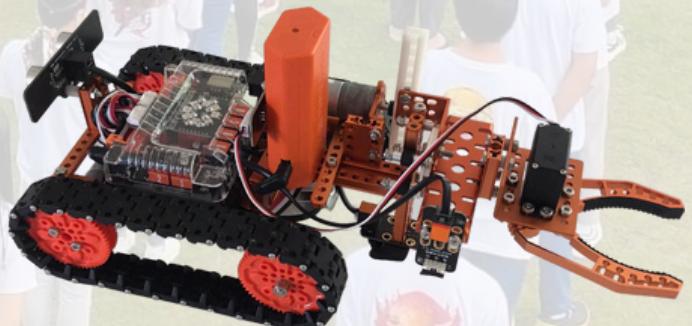
# INNOVATION

## SPECTACULAR 2024: BEST SHS INNOVATION



REPRESENTED OUR SCHOOL ON THE SPECTACULAR 2024 (SHS INNOVATION) WITH OUR CLAWVER: CLAW-LIFT REMOTE CONTROLLED ROVER ON MARCH 20, 2024.

RECEIVED THE AWARD FOR SPECTACULAR 2024 BEST SHS INNOVATION IN BAUAN TECHNICAL INTEGRATED HIGH SCHOOL ON MARCH 22, 2024.



# OUTSTANDING PERFORMANCE IN INNOVATION



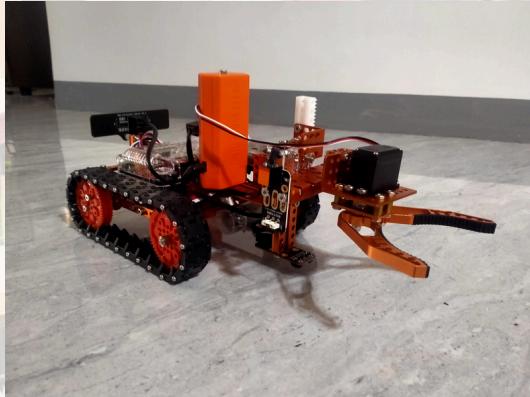
The CLAWVER: CLAW-LIFT REMOTE CONTROLLED ROVER is a remarkable project developed by Grade 12 Newton STEM students during the design, construction, and assessment phase. The robot, which combines the functionalities of a forklift and a claw, exhibits exceptional qualities that align with the specified criteria.

In terms of output, the CLAWVER excels in various aspects. Its originality and novelty contribute to its uniqueness, earning it high scores in the originality criterion. Moreover, the CLAWVER demonstrates relevance, applicability, replicability, sustainability, and usefulness to both the school and the larger community, making it a valuable asset. The robot's cost-effectiveness, efficiency, and practicality further enhance its appeal. Additionally, the CLAWVER prioritizes environmental safety, ensuring that it meets the necessary standards.



During the design phase, the students acquired essential skills in Arduino programming and designed a range of robots, including sumo-bots, line followers, and a robotic arm tank. Under the guidance of Mr. Ernie G. Santoyo, the students gained a solid understanding of Arduino programming fundamentals. Within a span of two months, a team member with prior robotics knowledge conceived the idea of the CLAWVER, a robot that combines the functionalities of a forklift and a claw.

# OUTSTANDING PERFORMANCE IN INNOVATION



During the construction phase, the students assembled, disassembled, and coded various robots, including the CLAWVER, using Arduino and Weeetcode software. The final CLAWVER prototype showcases remarkable features, such as a drivetrain, a lifting mechanism, a multi-grip claw, and a range of sensors. These sensors include an ultrasonic sensor for obstacle detection, a light sensor, an infrared sensor for detecting steep slopes, a limit switch, and onboard lights for illumination.

During the assessment phase, the students conducted comprehensive tests on the CLAWVER prototype's functionalities using Weeetcode programming. The tests encompassed the drivetrain, lifting mechanism, claw grip, and sensor capabilities. A team member identified a chassis bending issue caused by excessive weight on the lifting mechanism, which was resolved by adding a support beam. The group also addressed coding issues beforehand, ensuring the robot's adaptability in different settings.



In summary, the CLAWVER: CLAW-LIFT REMOTE CONTROLLED ROVER is an exceptional project that showcases the students' skills in Arduino programming and robotics. With its innovative design, practicality, and commitment to environmental safety, the CLAWVER has the potential to make a positive impact within the school and the larger community.





# **DELIVERY OR PRESENTATION (15%)**

## **AS SHOWN THROUGH:**

- A. CLARITY OF THE PRODUCT DEVELOPMENT PROCESS AND THE INNOVATIVE FEATURES SHOWN DURING PRESENTATION.
- B. ACCEPTABILITY OF THE INNOVATION TO THE TARGET BENEFICIARIES.

# OUTSTANDING PERFORMANCE IN INNOVATION



The CLAWVER: CLAW-LIFT REMOTE CONTROLLED ROVER project not only excels in its design and functionality but also delivers a compelling presentation that showcases the innovative features and the clarity of the product development process. Additionally, the students proactively addressed coding issues before the construction stage, ensuring that the robot could adapt to various settings.

The delivery and presentation of the CLAWVER project were impressive, with a clear and concise explanation of the product development process. The students effectively highlighted the innovative features of the CLAWVER, captivating the audience's attention. Moreover, the innovation proved to be highly acceptable to the target beneficiaries, further reinforcing its potential impact.





# **STUDY OR RESEARCH (15%)**

**AS SHOWN THROUGH:**

A. RESEARCH BASIS OF THE SERVICE OR PRODUCT



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SCHOOLS DIVISION OF BATANGAS  
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San Roque, Rosario, Batangas

**Clever: Claw-Lift Remote Controlled Rover**

An Innovative Output in Gen Physics 1-2

SY 2023-2024

**Proponents:**

Gregorio, Ronjae Calvin M.

Magaling, Karlo C.

G12 - Newton

Validated and Approved by:

**Mr. Ernie G. Santoyo**

Teacher III



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SCHOOLS DIVISION OF BATANGAS  
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	<b>Objective</b>	<b>Activities</b>	<b>Persons involved</b>	<b>Time frame</b>	<b>Learning outcomes</b>
Design stage	<p>Obtain an in-depth understanding of the objectives, operational capabilities, and ideal aesthetics of the Clawver project.</p> <p>Define the specific audience and intended purpose for the Clawver project.</p>	Design sensible and attainable 3D models for the robot's design while taking user experience, functionality, and technical viability into account.	<b>Adviser</b> Santoyo, Ernie G.  <b>Students</b> Carpela, Justine James B. Gregorio, Ronjae Calvin M. Magaling, Karlo C. Rosales, Kirby F.	August - September	Gaining knowledge of different robot components, such as motors, sensors, and selecting them based on their functionality and technical limits, while also developing programming abilities to control robot movement and utilize sensors effectively.



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Construction stage	Achieve the intended capabilities of the robot by systematically building it in stages.  Review the project to identify any areas for improvement or further development.	Assembly of the robot's structure, integrate components, and program its functionalities.	Carpela, Justine James B. Gregorio, Ronjae Calvin M. Rosales, Kirby F.	October -November	Acquire hands-on experience in assembling and assembling robot components to develop a functional and reliable robot.
Assessment stage	Thoroughly assess the performance of the final Clawver robot prototype in every aspect of its functionalities.  Pinpoint any aspects that can be enhanced or require additional work.	Test of the robot's functionalities which are the drivetrain, claw, lift, sensors, and lights  Rewrite the program, and make recommendations for improvement.	Carpela, Justine James B. Gregorio, Ronjae Calvin M. Rosales, Kirby F.	December - January	Enhancing critical thinking skills by recognizing strengths and weaknesses, and suggesting effective strategies for improvement.



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In the design phase, Grade 12 Newton STEM students learned Arduino programming and designed various robots, including sumo-bots, line followers, and a robotic arm tank. Mr. Ernie G. Santoyo's guidance was instrumental in helping students grasp the fundamentals of Arduino programming. Within two months, a group member with prior knowledge of robotics conceptualized the Clawver project, a robot combining forklift and claw functionalities.



The construction phase involved building and testing various robots over a two-month period. This included sumo-bots, line followers, a robotic arm tank, a claw robot, and finally, the Clawver project - a forklift-claw combination. Construction involved assembling, disassembling, and coding using both Arduino and the provided Weeetcode software.

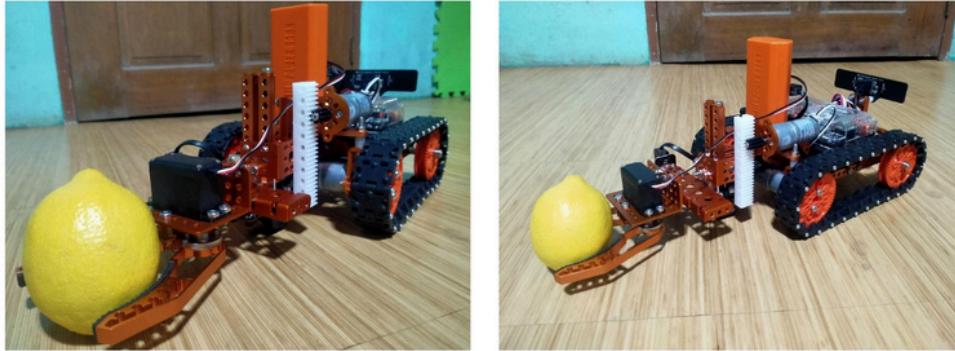
The final Clawver prototype boasted several functionalities: a drivetrain for movement, a lifting mechanism, a multi-grip claw capable of handling various objects, and multiple sensors. These sensors included an ultrasonic sensor for obstacle detection, a light sensor, an infrared sensor for detecting steep slopes, a limit switch to prevent over-lowering of the lifting mechanism, and onboard lights for illuminating dark spaces.



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The assessment phase involved testing the final Clawver prototype's functionalities using Weeetcode programming. The tests covered the drivetrain, lifting mechanism, claw grip, and sensor capabilities. During testing, a group member identified a chassis bending issue caused by excessive weight on the lifting mechanism. To address this, a support beam was added near the mechanism. Additionally, the group addressed coding issues before the construction stage, making the robot adaptable to various settings.



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# CERTIFICATE of RECOGNITION

is given to

*Ronjae Calvin M. Gregorio*

Rosario Integrated National High School  
CLAWVER (Claw-Lift Remote Controlled Rover)

for being awarded as the

## Best SHS INNOVATION

which highly exhibits creativity and application of learning  
in the respective subject area,

during the conduct of SDO Batangas Province-Senior High School Spectacular 2024  
held on March 20-22, 2024, at Bauan Technical Integrated High School,  
Bauan, Batangas.

Issued on March 22, 2024, at Bauan Technical Integrated High School, Bauan, Batangas.

*miznie*  
MARITES A. IBANEZ, CESO V  
Schools Division Superintendent



Republic of the Philippines  
Department of Education  
REGION IV-A CALABARZON SCHOOLS  
DIVISION OF BATANGAS



# CERTIFICATE of PARTICIPATION

is given to

*Ronjae Calvin M. Gregorio*

for actively participating in

## Senior High Spectacular 2024

held on March 20-22, 2024 at Bauan Technical Integrated High School,  
Bauan, Batangas.

Issued on March 22, 2024 at Bauan Technical Integrated High School,  
Bauan, Batangas.

*miznie*  
MARITES A. IBANEZ, CESO V  
Schools Division Superintendent