

# DEVELOPMENT OF SEMI-AUTOMATED GUIDED VEHICLE FOR FERTIGATION AGRICULTURE

INVENTOR: NURUL AIN BINTI ROSLI  
FACULTY: FACULTY OF ENGINEERING TECHNOLOGY  
MANUFACTURING AND MECHATRONIC  
UNIVERSITY: UNIVERISTI MALAYSIA PAHANG  
EMAIL: nurulainrosli196@gmail.com  
CO-INVENTORS: 'AINA NAJWA BINTI AZMI, MUHAMMAD ARIFF  
HAKIMI BINTI MOHD KAMAL, DR MOHAMAD RUSYDI BIN  
MOHAMAD YASSIN



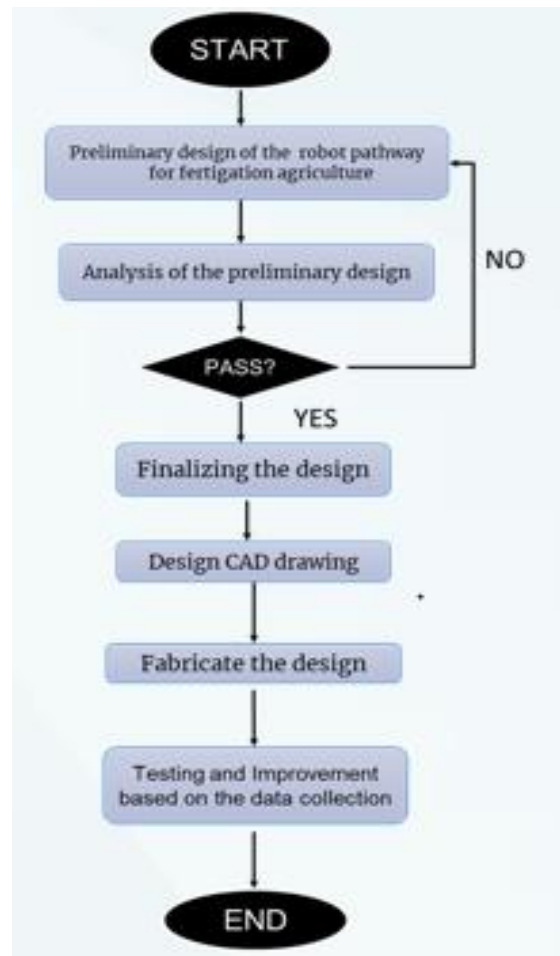
## PRODUCT BACKGROUND

- The design of this project is to carry the pesticide spraying system for the fertigation purpose.
- The system is basically a semi-automated guided vehicle controlled by Arduino Uno and guided by railway meanwhile the man power is minimized by only turned on the switch and it will move accordingly as set.

## TECHNICAL ELEMENTS

CRITERION	EXPLANATION
Ease of Handling	If want to check the batteries or the wiring, there are two doors that connected to those items,
Ease of Use	To allow the movement occur only need to on the switch.
Safety	The sharp edges are removed to prevent getting injury while moving the body and emergency stop button is installed to off the movement

## METHOD FLOWCHART

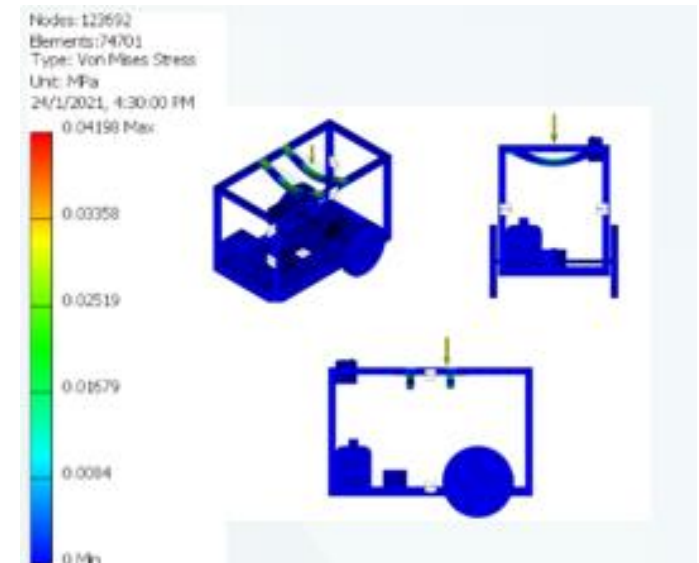


## COLOUR ANALYSIS & STRUCTURAL ANALYSIS

Table 1 Condition of Colour Sensor and result of SGV movement

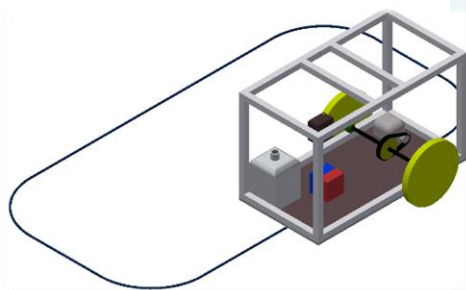
Marked Place	Distance sensor to the Red Board (cm)	Red Frequency	Blue Frequency	Green Frequency	Motor condition (Red max value = Stop)
Point 1	7.631	38	35	30	Stop
Point 2	7.634	38	36	30	Stop
Point 3	7.633	38	37	30	Stop
Point 4	7.630	38	35	30	Stop

## FEA (Finite Element Analysis)



## RESULTS

### CAD DESIGN OF RAILWAY AND SGV USING AUTODESK INVENTOR



### Pesticide Spraying System



No.	Product Detail	Description
1	L*H*W	0.86m x 0.46m x 0.56m
2	Battery	Lead Acid 12V 7.2AH
3	Material	Aluminium Profile, Acrylic, Mild Steel base
4	Net weight (Kg)	15kg
5	Guided Method	Pathway (Rail)
6	Wheel	3 Wheels
7	Mechanism	1 driving wheel on rail
8	Motor	Electric Scooter Motor

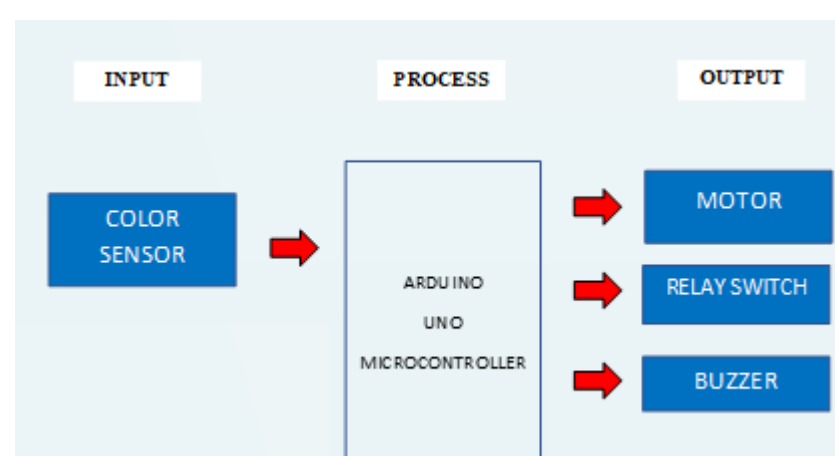
## BENEFITS

- Low maintenance
- Low cost
- Easy the duty of the farmer
- High corrosion resistance

## STATUS OF INNOVATION

- Prototype

## ARDUINO BLOCK DIAGRAM



## CONCLUSION

The SGV is efficient enough to move the spraying system to perform the fertigation process plus lower price than other unmanan ground vehicle in the market.

## ENVIRONMENTAL IMPACT

- Eco-friendly since no harmful effect to the environment