

○ Trekking Baton

What?

Multi-functional trekking baton is a versatile and innovative product designed to enhance the trekking experience.

Key features:

- Trekking pole
- Charging port
- Electrocutor
- Torch
- Mobile holder

Result

The product is designed with a strong focus on durability and sustainability.

- Material used: Aluminum for strength and portability
- Folding mechanism: Flip-lock mechanism
- Battery type: Rechargeable alkaline batteries

○ Water Treatment Plant

What?

This project showcases the design and application of a water treatment plant. Fundamental principles are used to build the prototype of water treatment plant to convert even highly turbid water to clean water. We fabricated all the components by ourselves with minimum materials.

Key Steps:

- Coagulation: Alum is used
- Flocculation: Magnetic stirrer is used
- Sedimentation and Decantation
- Charcoal and Sand filter: layers of activated charcoal, sand, pebbles formed the filtration tank.

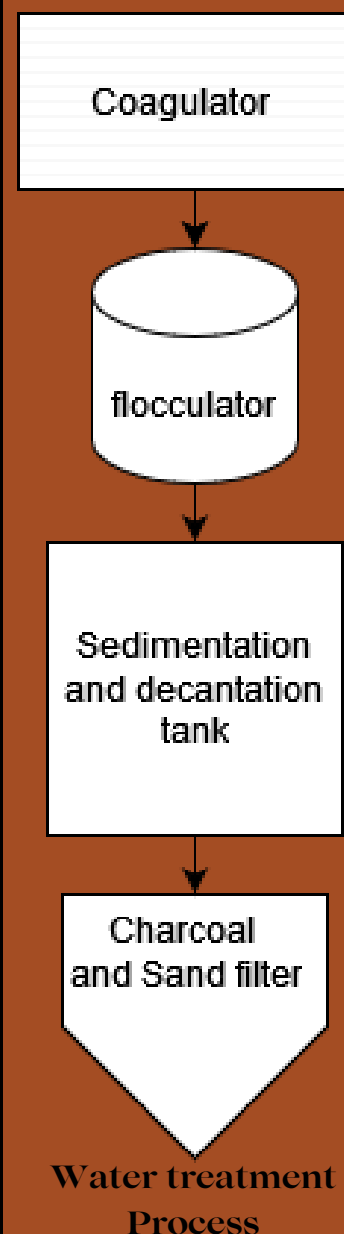
Impact and benefits

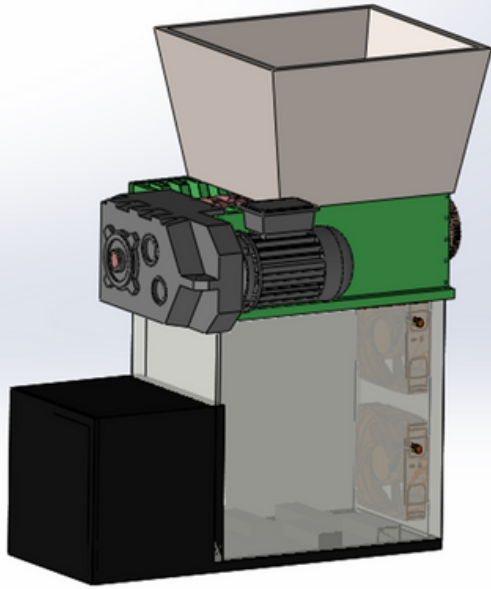
- Improved water quality
- Sustainable solution
- Cost-effective and efficient

P.S. This project led me to emerge as the winner in the design competition.



Prototype





○ Mask Shredder

What?

A mask shredder is designed to convert used masks into the mask fiber along with the separation of the mask strip from the fiber.

How?

- Used masks were first sterilized using alcohol and then dried under direct sunlight.
- Shredded inside the shredder
- An eddy current separation method is used to separate the aluminum strip from the mask fiber.
- Separated mask fibers were then UV light treated.

Result

SolidWorks model for the mask shredder is designed and strength analysis of the shredder is done.

○ Water Pollutants collector

What?

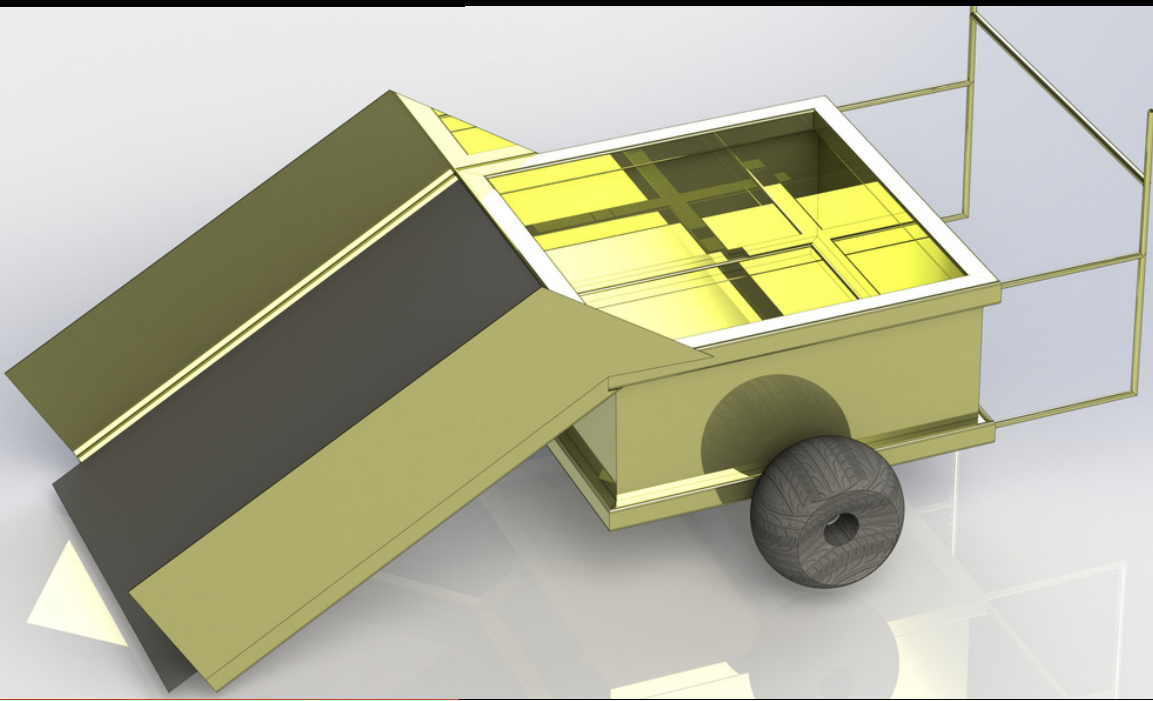
The water pollutant collector works on collecting the pollutants, tailored especially for the rivers of Nepal. The 3D model is made utilizing the power of CAD software, SolidWorks.

Impacts and Benefits

- Water quality enhancement
- Environmental conservation
- Technological innovation

Design and Features:

- **River Compatibility:** Tailored for Nepalese rivers.
- **Pollutant Trapping Mechanism:** Pollutant collection plate is attached at the bottom of the conveyor belt. Pollutants from the water get collected on the plate, and then they are moved into the trash collector through conveyor.
- This is suitable especially to collect pollutants from the bank of the river rather than from flowing water.



Design and Analysis of Electric vehicle chassis frame using Finite Element Method

What?

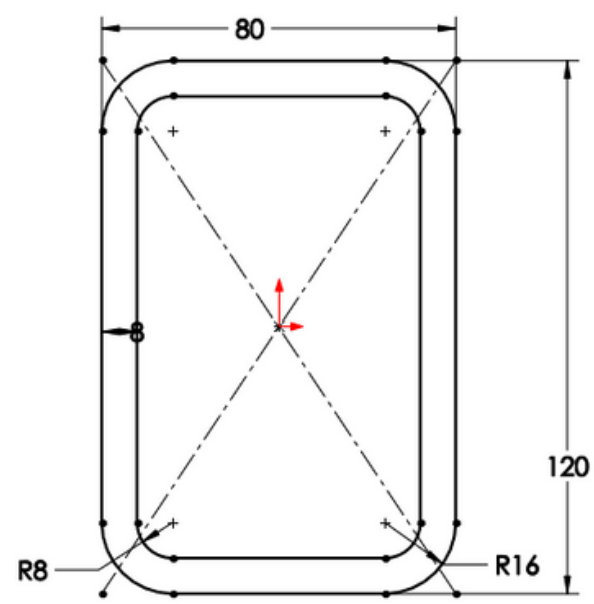
This is a design project targeted especially for the design of electric vehicle chassis frame using the finite element analysis for structural analysis.

Methodology

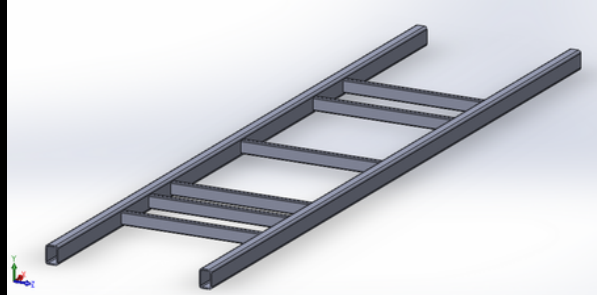
- Initially, the intensity of load on the chassis is calculated considering different loading conditions and utilizing the data obtained from different automotive industries and research papers.
- A combination of ladder and skateboard chassis is chosen for the final model.
- Ashby chart and material selection matrix are used for material selection.
- Chassis frame section and dimension of the chassis frame are determined using the principles of solid mechanics.
- Static structural analysis of the chassis frame is done in ANSYS and several iterations are run to obtain the most suitable dimension for the chassis frame.
- Modal analysis is performed on the final design to check for the natural frequency of the chassis frame.

Results

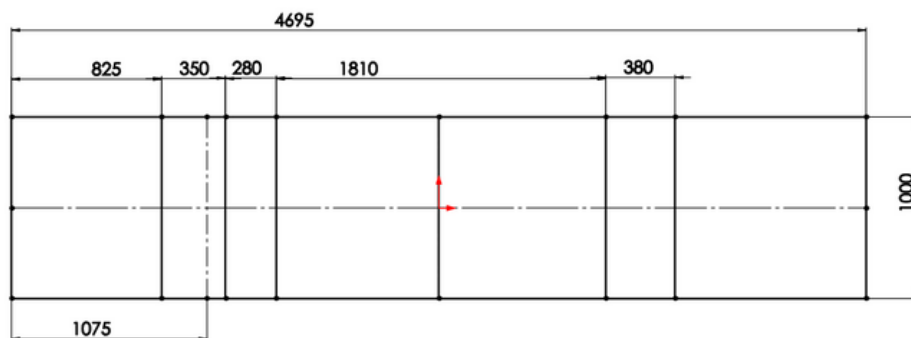
- Chassis frame final mass: 242.4 kg
- Profile of the chassis frame: Rectangular Hollow section [RHS] 120x80/8
- Maximum Equivalent stress on the model: 93.58 MPa
- Factor of Safety: 2.6



Weldment profile



Isometric view of chassis



line sketch of chassis frame with dimensions