[Text

Description automatically generated](https://www.linkedin.com/company/mcmaster-autoplow/)Side Paneling (TurtleBot)

*Mechanical-oriented*

**Objective:**

The TurtleBot needs side paneling to protect the electronics from dust, dirt, and debris. The side panels should ideally be lightweight, match the contour of the TurtleBot, and provide a good seal around the mounting posts and stages.

**Constraint(s):**

The charging port must be accessible without needing to disassemble the casing, but ideally seal the charging port when not charging.

**Preliminary Ideas/Brainstorming:**

Diagram

Description automatically generated

*^^ “*[*draw.io*](https://app.diagrams.net/)*” is used for the above diagram, but above diagram is only a suggestion (feel free to make your own brainstorming process/setup!)*

**Concept Sketches :**

**Matrix Evaluation (Decision and Pugh):**

Decision Matrix

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria** | **Weighting (\_\\_)** | **Idea #1** | **Idea #2** | **Idea #n** |
| *Criteria #1* | W1 | W1 \* R1 = S1 | W1 \* R1 = S1 | W1 \* R1 = S1 |
| *Criteria #2* | W2 | W2 \* R2 = S2 | W2 \* R2 = S2 | W2 \* R2 = S2 |
| *Criteria #3* | W3 | W3 \* R3 = S3 | W3 \* R3 = S3 | W3 \* R3 = S3 |
| *Criteria #n* | W4 | W4 \* R4 = S4 | W4 \* R4 = S4 | W4 \* R4 = S4 |
| **Total** |  | **SUM(S1;S4)** | **SUM(S1;S4)** | **SUM(S1;S4)** |

*R\_ = rating for that criterion*

*(rating can be out of whatever you choose, but try to stick to round numbers like \_/5 or \_/10)*

*\*\*\*Make sure to rate designs criteria appropriately (i.e., if cost is high, rating shouldn’t be high)\*\*\**

Pugh Matrix

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Criteria** | **Weighting (\_\\_)** | Current Solution | **Idea #1** | **Idea #2** | **Idea #n** |
| *Criteria #1* | W1 | 0 | +1 \* W1 | 0 \* W1 | -1 \* W1 |
| *Criteria #2* | W2 | 0 | 0 \* W2 | 0 \* W2 | -1 \* W2 |
| *Criteria #3* | W3 | 0 | -1 \* W3 | -1 \* W3 | -1 \* W3 |
| *Criteria #n* | W4 | 0 | -1 \* W4 | +1 \* W4 | 0 \* W4 |
| **Total** |  | 0 | **SUM(S1;S4)** | **SUM(S1;S4)** | **SUM(S1;S4)** |

*Rate with +1 if idea is better, 0 if idea is just as good, and -1 if idea is worse than currently selected design*

\*\*\*Weightings are **optional**, but they help identify designs based on proficiency *and* priority\*\*\*

**Low-Fidelity Prototype Pictures:**

(CAD designs/prints, cardboard + duct tape models, as long as it’s a physical prototype)

**Design Considerations/Adjustments:**

**Test Plan:**

**Final Design:**