

LET'S PLAY HOCKEY WITH The Double-Pivot Mechanism

Background Information

Most Powerchair Hockey Level III Players have limited upper body strength, making them unable to control a hockey stick. Thus, their sticks stay stationary and attached to the wheelchair.

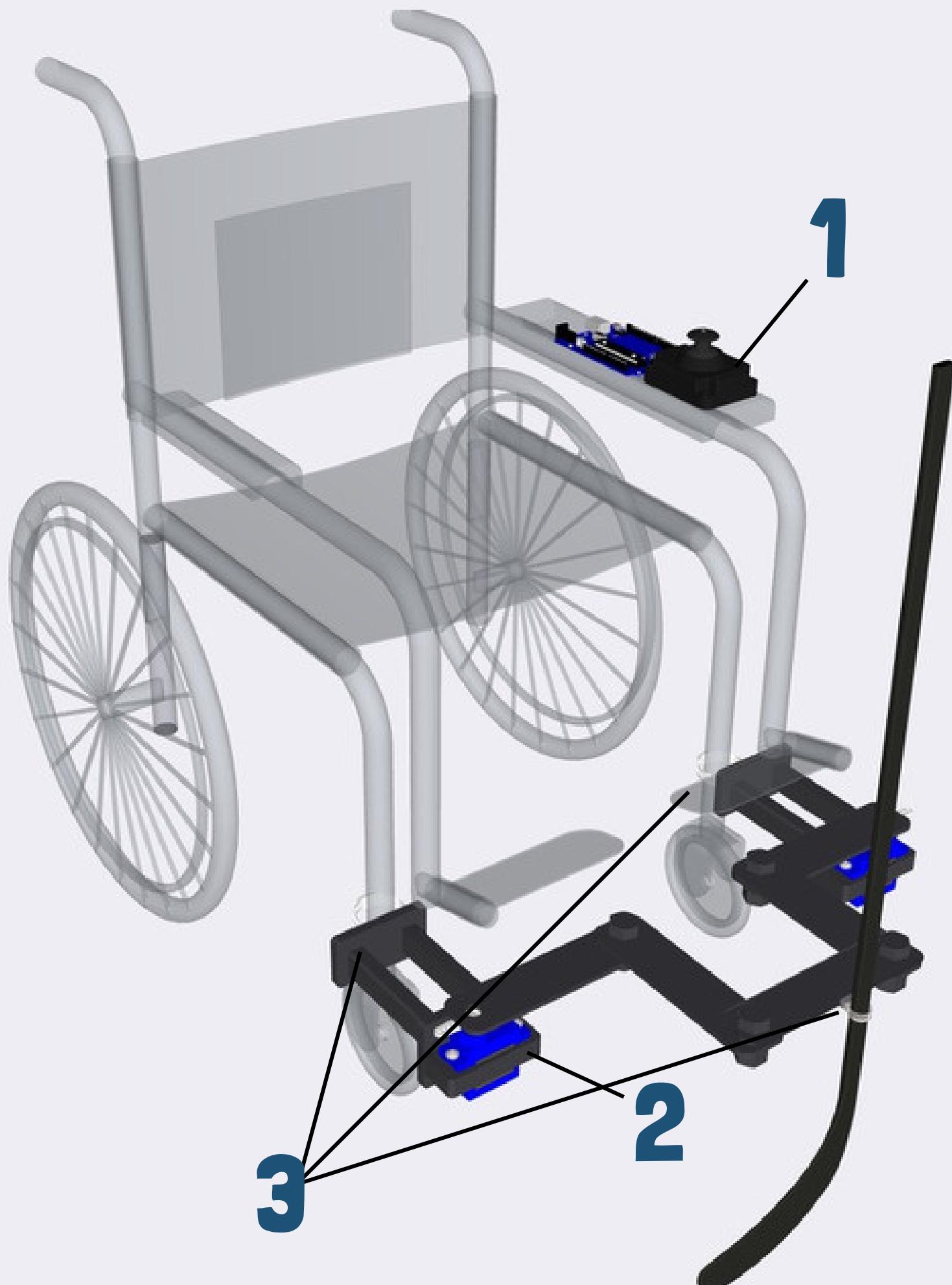


Opportunity

Facilitating Level 3 players' playing ability and stick dexterity

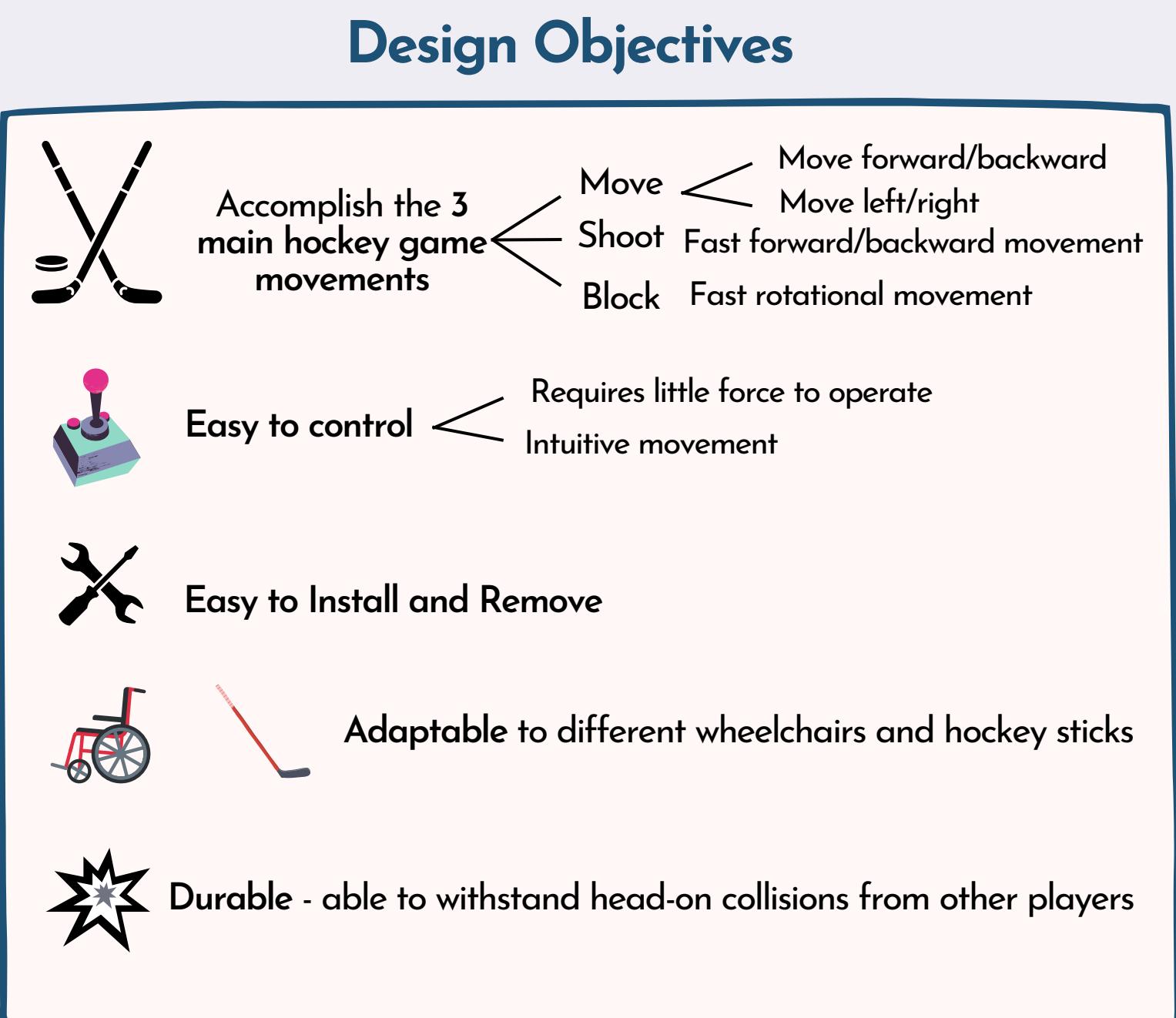
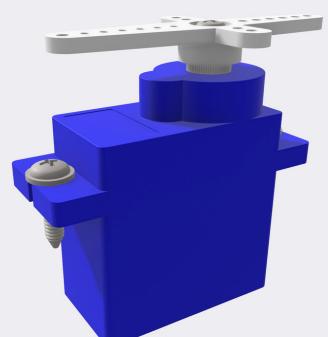
Relating Our Design to the Community

The Double-Pivot Mechanism design aims to enable level III players to manoeuvre the stick easily and precisely using a joystick controller. Our mechanism aims to achieve three movements that are important to hockey players; manipulating, shooting and blocking the ball. This will in turn increase level III players' involvement in the game.



2 Motor Decision

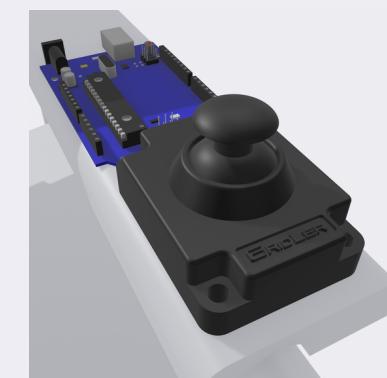
- Two servo motors are used to provide precision and reliability.
- Testing and calculations, shows that the motor must have a torque of 160kg/cm and a rotational velocity of $0.0367\text{sec}/60^\circ$ to ensure the mechanism can mimic level I and II players.



Detailed Design Features

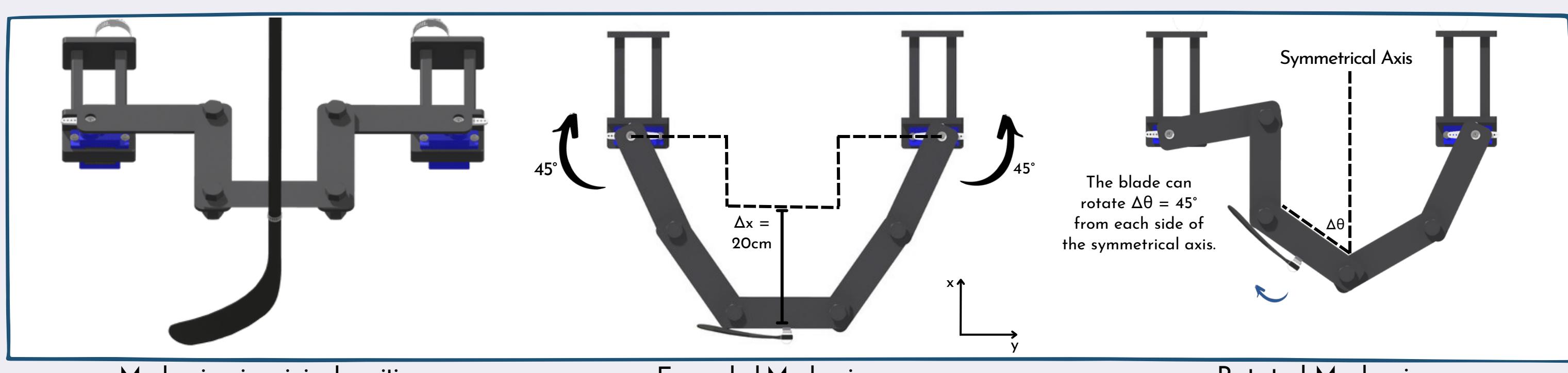
1 Controller Decision - Joystick

- The joystick is programmed to allow intuitive control using an Arduino IDE so that players can easily manipulate the stick in multiple directions.
- The modular design means it can be fitted on either side of the wheelchair (left-handed/right-handed).
- Additionally, according to the powerchair hockey community, 95% of level III players can exert enough force from both hands to control a joystick precisely, ensuring our design is accessible to the majority of level III players.



3 Connection Decision - Hose Clamp

- The hose clamp ensures a secure connection in two areas; the mechanism to the wheelchair as well as the mechanism to the hockey stick.
- Hose clamps are able to be tightened or loosened depending on the area of connection. This guarantees that the mechanism is accessible to all different wheelchair types.



Mechanism in original position
(Top Front View)

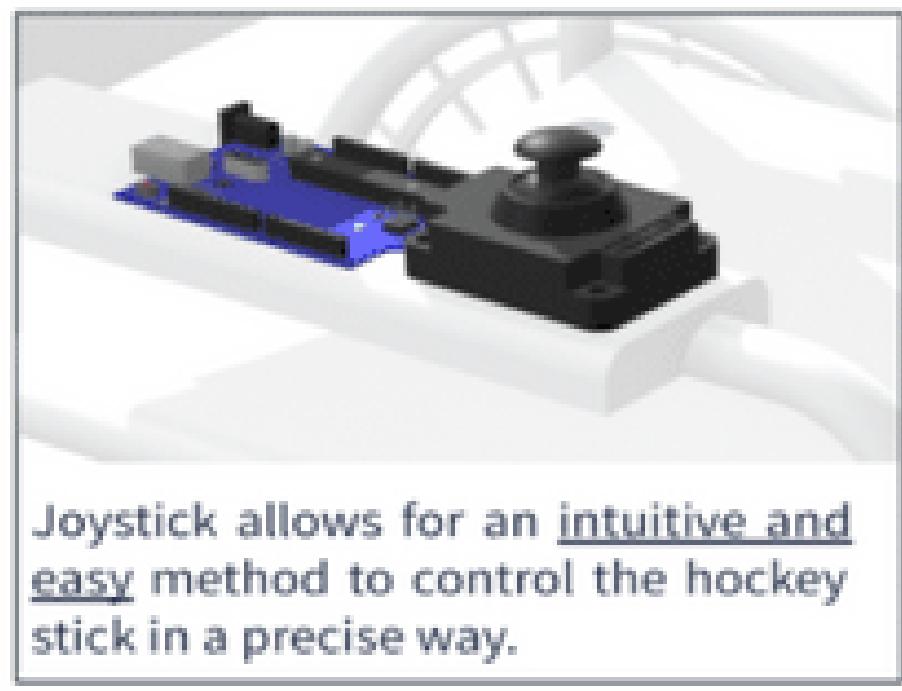
Expanded Mechanism
(Top View)

Rotated Mechanism
(Top View)

The Double-Pivot Mechanism

Our solution aims to increase the playing ability of powerchair hockey players by adding degrees of freedom to those who cannot control a hockey stick.

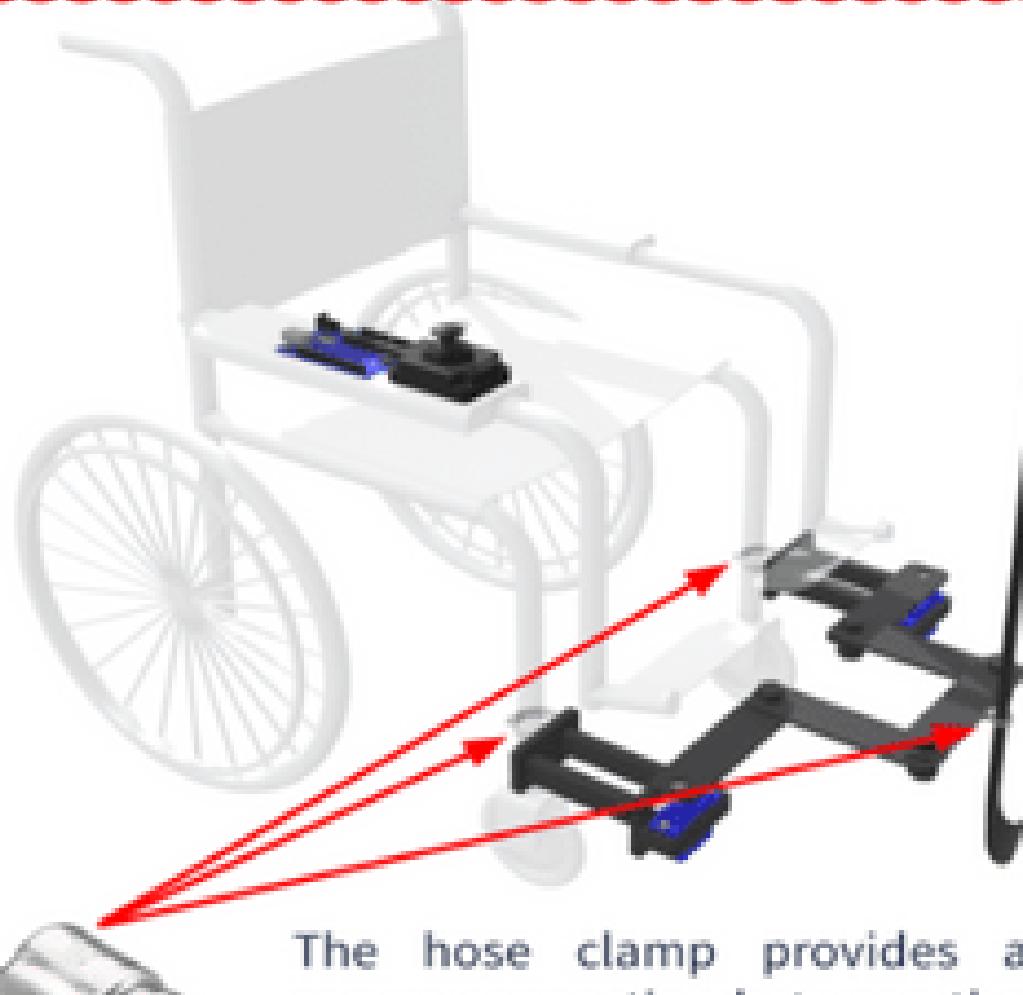
The mechanism and electronics can be fitted on any wheelchair with minimal installation.



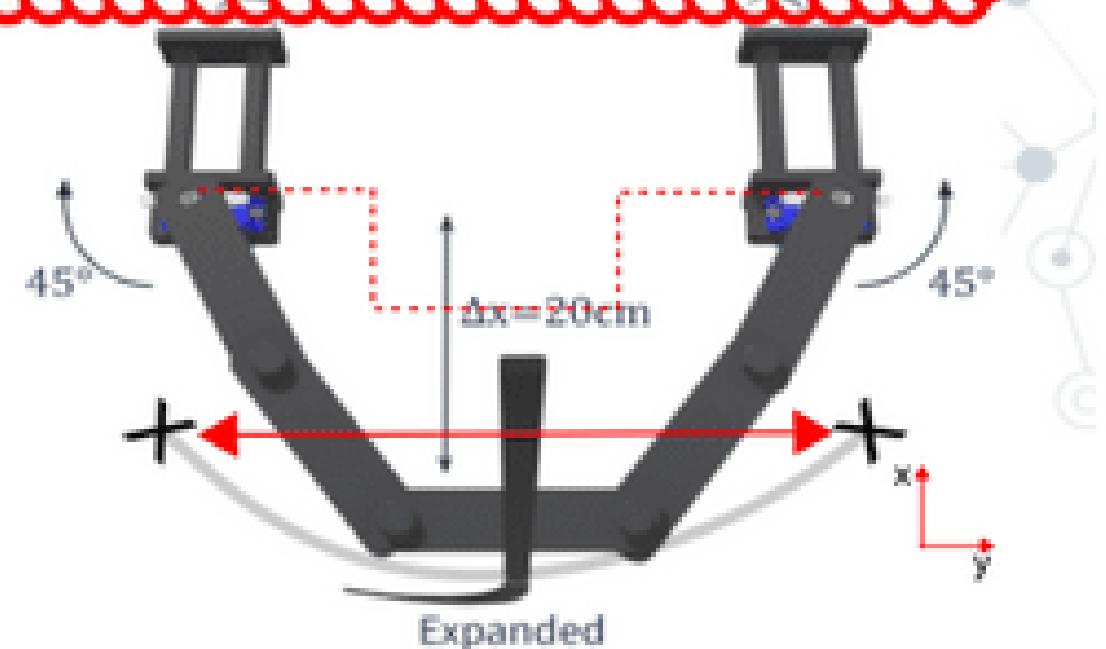
Joystick allows for an intuitive and easy method to control the hockey stick in a precise way.



The hose clamp provides a secure connection between the mechanism and the wheelchair. The mechanism can be used with any hockey stick.



I would say you are increasing the range of the hockey stick's reach (first sentence) for Level III players.



Shoots the ball at 14 [m/s]

Two motors provide precision and reliability.

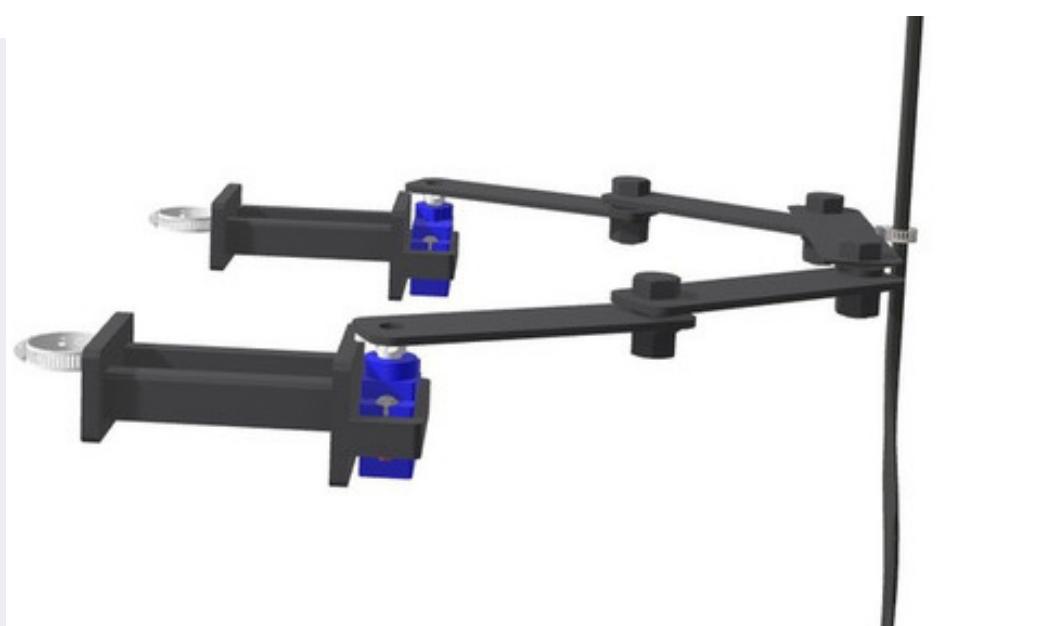
By expanding, it mimics hockey players shooting forward.

Can withstand a head-on collision with another player.

When you are explaining the technical aspect then you can say that you are providing 2 degrees of freedom along the Z plane in the X and Y direction (in your figure on the right - add an x and y axis) using rotation of joints (you can name your joints) between 0-45 degrees to provide linear movement of the hockey stick. Extend your delta x to the position of the hockey stick. Find your delta y as well. You can superimpose the initial retracted mechanism on the extended pose to better analyze the pathway and range in motion of the end effector. From the superimposed mechanism, your delta x is seems smaller.

Increased range of hockey stick reach (end effector) can be described through:

- Delta x
- Delta y
- 2 Degrees of freedom (x and y):
- 0: 0-45 of the end effector about its initial position



requires the ability to manage stress and achieve one's potential.



Nutrition



Sleep

Stress is normal, but too much can increase the risk of mental health problems.

Coping Skills



Exercise



Physical Activity Ideas For Self-Care That You Might Consider Do It



Make an attempt at yoga



Take a dance class



Go for a walk or run at the park



Drink a coffee at local coffee shop with a good friend



Volunteering yourself at nearby nursing home



Playing your favorite game with a good friend

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IDEAS SELF-CARE ACTIVITY TO DO FOR MEN

Listen to music

Meditate

Take a hot shower or a warm bath to relieve stress

Spend some time in the outdoors

Watch a movie on your computer

Take a bike trip around the countryside



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Tips Overcome fear of Accusation

Understand
your own abilities
and limits.

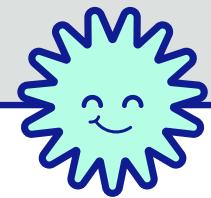
Make an
investment in
yourself.

Refrain from
allowing others
to define you

Recognize and
acknowledge your
inner critic



ACADEMIC RESEARCH POSTER



Research posters are visual aids that are used to present a study. It is a popular way to showcase research work in conferences and the academe. Information is presented concisely and in a visually appealing manner to attract attention and spark discussion.

AUTHORS

Don't forget the names of the research authors and co-authors. Use full names and include any titles or honorifics the authors may have, as well as the university or research institution they are representing.

AFFILIATIONS

Researches are often under or on behalf of a university, an organization, or academic/research institutions. When available, include their logos with the names.

Introduction

This section gives an overview of the research. Start with the background: What are you studying and why? What is the importance of the research to the field or specific industry, and what can it contribute to the existing literature? Be mindful of the space of the poster. Include the important information, but be as straightforward as possible

Results

Results show the outcome of the research and should answer the question or hypothesis stated in the introduction. State what you've found from your study.

Analysis

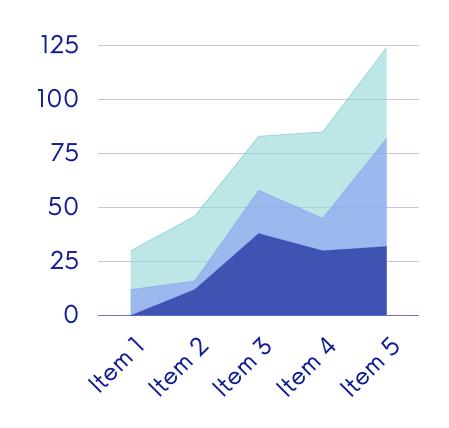
In a regular research paper, the analysis section is one of the longest parts as it builds on the information that supports the objective and thesis. With a research poster, you can trim down the analysis to the most important parts. Use bullets to emphasize points. Include key graphs, tables, graphics, and other images that support the study and show a visual analysis of the data.

Objective

In this section, state what is the objective of your study.

Methodology

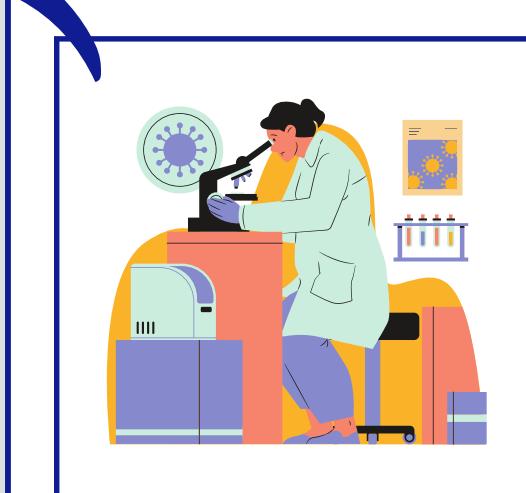
Describe how you've conducted your research. What is the strategy of the team? What methods were used? Were there any special technology applied?



Use graphs to show visualization of your data's analysis.

Conclusion

To wrap up your poster, present two to three key findings. You can also add a brief explanation or narrative to these that can encourage conversation or dialogue with the audience. These findings can be actionable items that can lead to implementation, policy creation, or further study.



Write a caption that will clearly explain what this graphic is about and how it relates to the study.

RELATED LITERATURE

References can take up a lot of space, so cite only the key references used in the study.



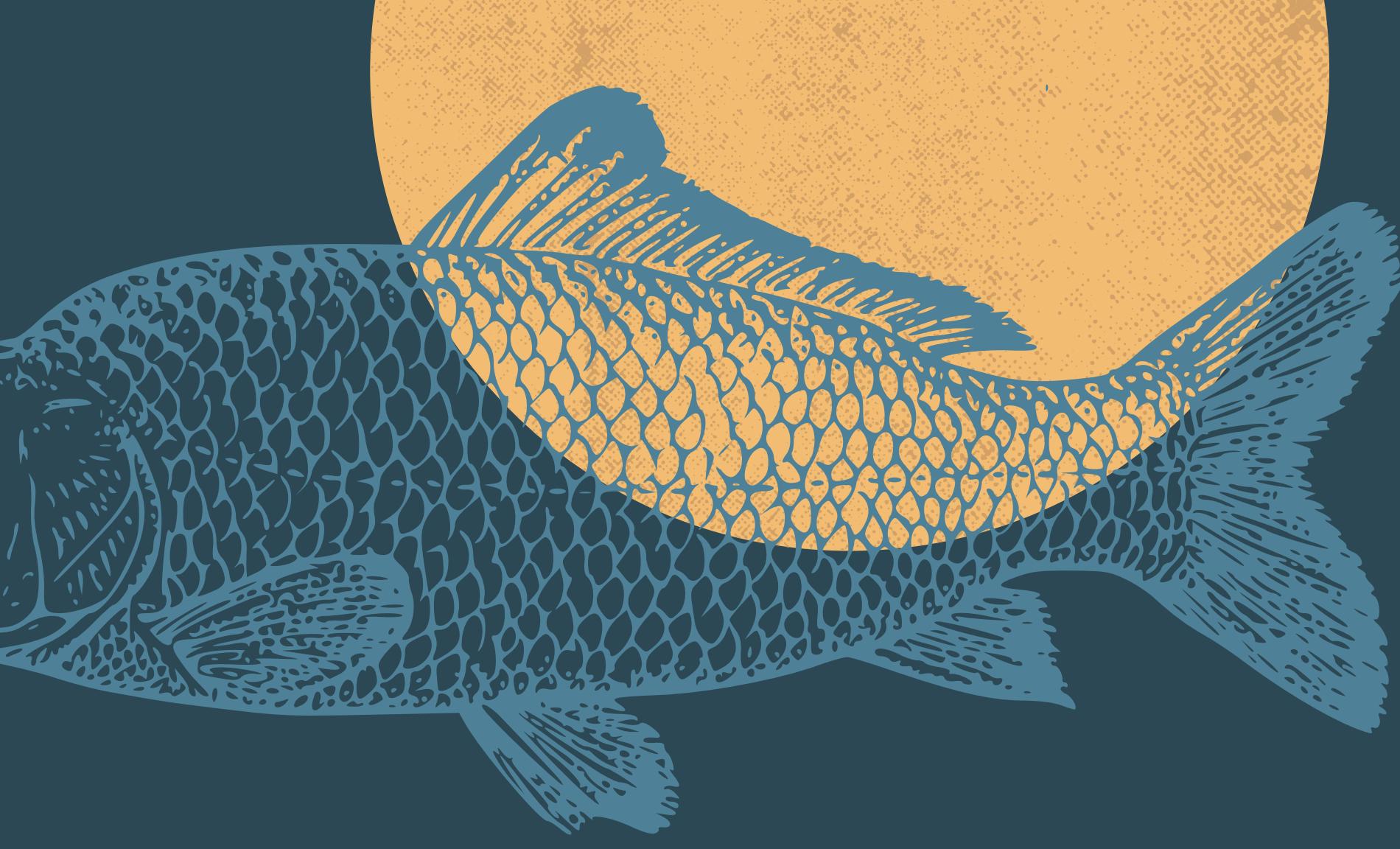
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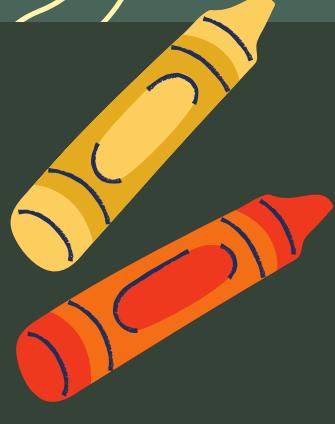
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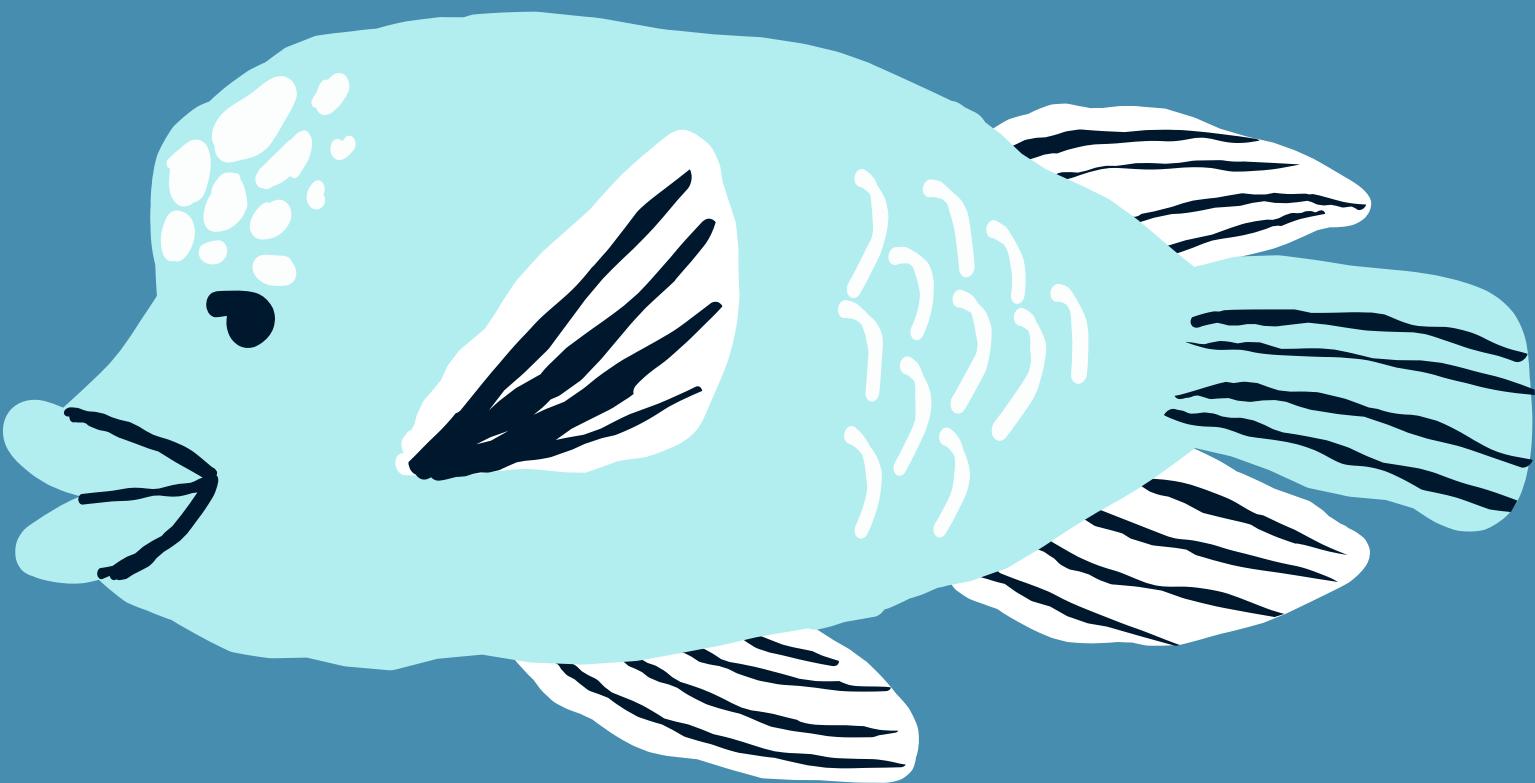
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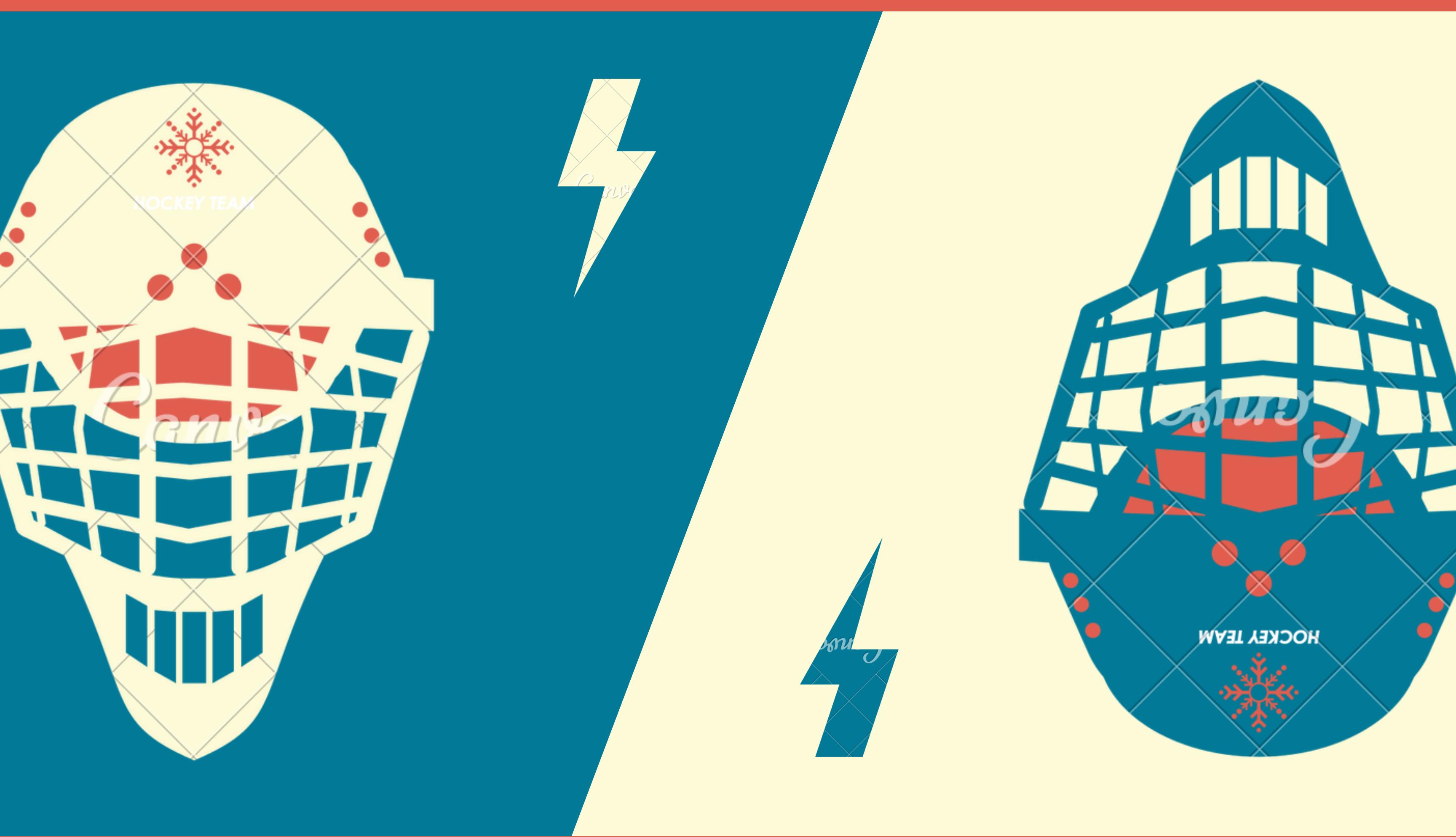
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