DALHOUSIE UNIVERSITY
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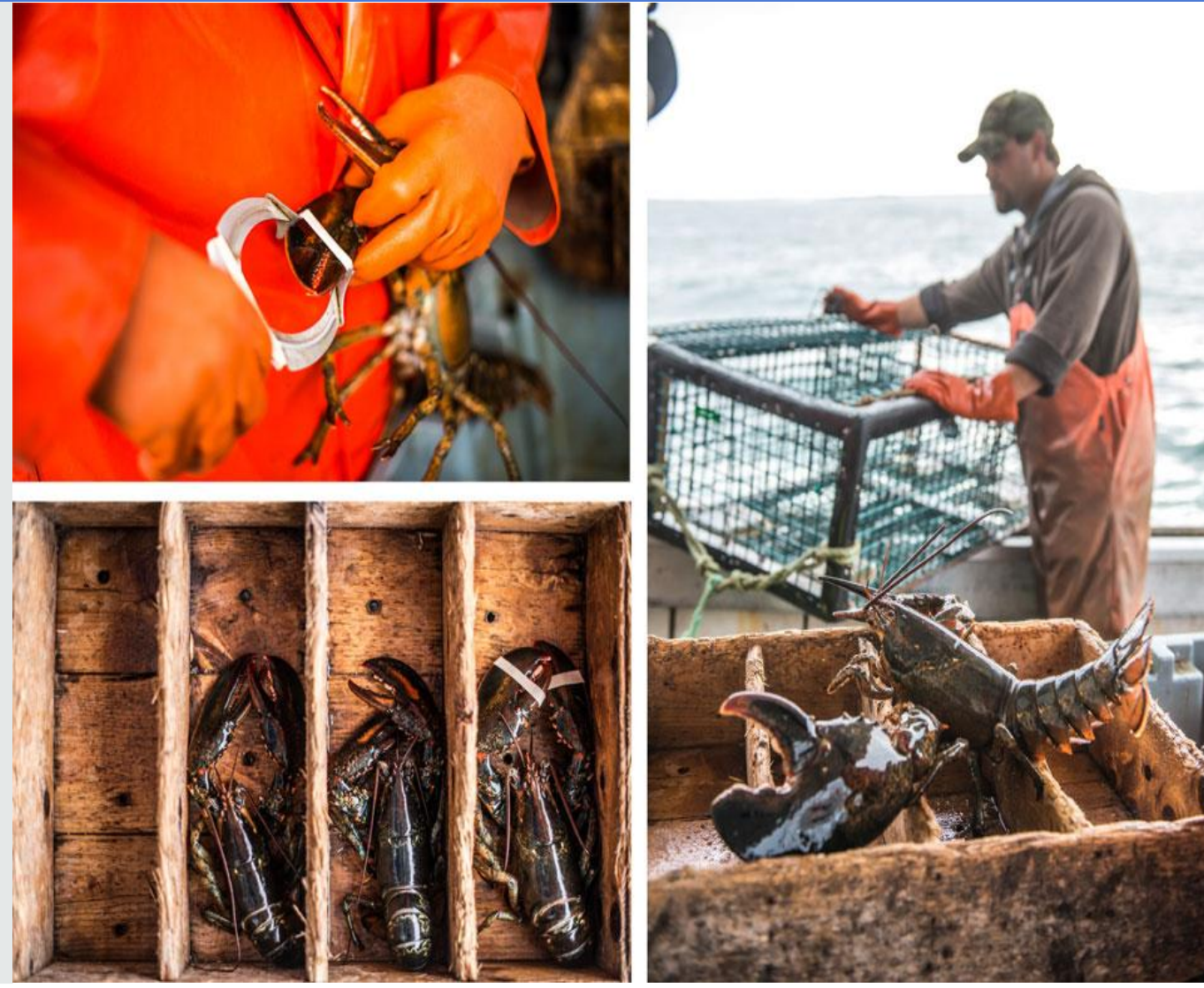
SeaLogR

Automated Vision System for Marine Animal Identification

Lobster Fishing Industry Background

- Lobster is Nova Scotia's most valuable seafood export, with an estimated value of $570 million in 2014[1]
- Observers can only monitor 1.5 to 2% of lobster fleet activity[2]
- Grading efficiency and data availability remain low

Project Requirements

1. The device shall be able to process 1 lobster specimens per second
2. The device shall be transportable by 1 – 2 people
3. The device shall take images that are adequate for analysis
4. The device shall not damage the lobster specimens
5. The device shall accommodate lobster specimens weighing up to 4 lbs.
6. The device shall be operable by 1 person in the field

Design Features

- All materials are food safe, preventing harm to the lobsters and the consumers
- Has multiple angle choices, allowing speed adjustment for varying conditions
- Prevents water in the environment from harming electrical components. In addition this promotes easy cleaning
- Slide design has no moving parts and simple assembly
- Small footprint allows for integration into existing commercial lobster processing facility

SeaLogR Lobster Grader

1. Slide is adjusted to one of four angle options by operator
2. Lobsters are manually placed on slide surface
3. Sliding lobster triggers camera system, prompting a photo to be taken
4. Machine learning software analyzes the image and returns biometric data
5. Biometric information is sent to a data management system for user friendly review and storage
6. Lobster exits slide and is placed in a crate for further processing
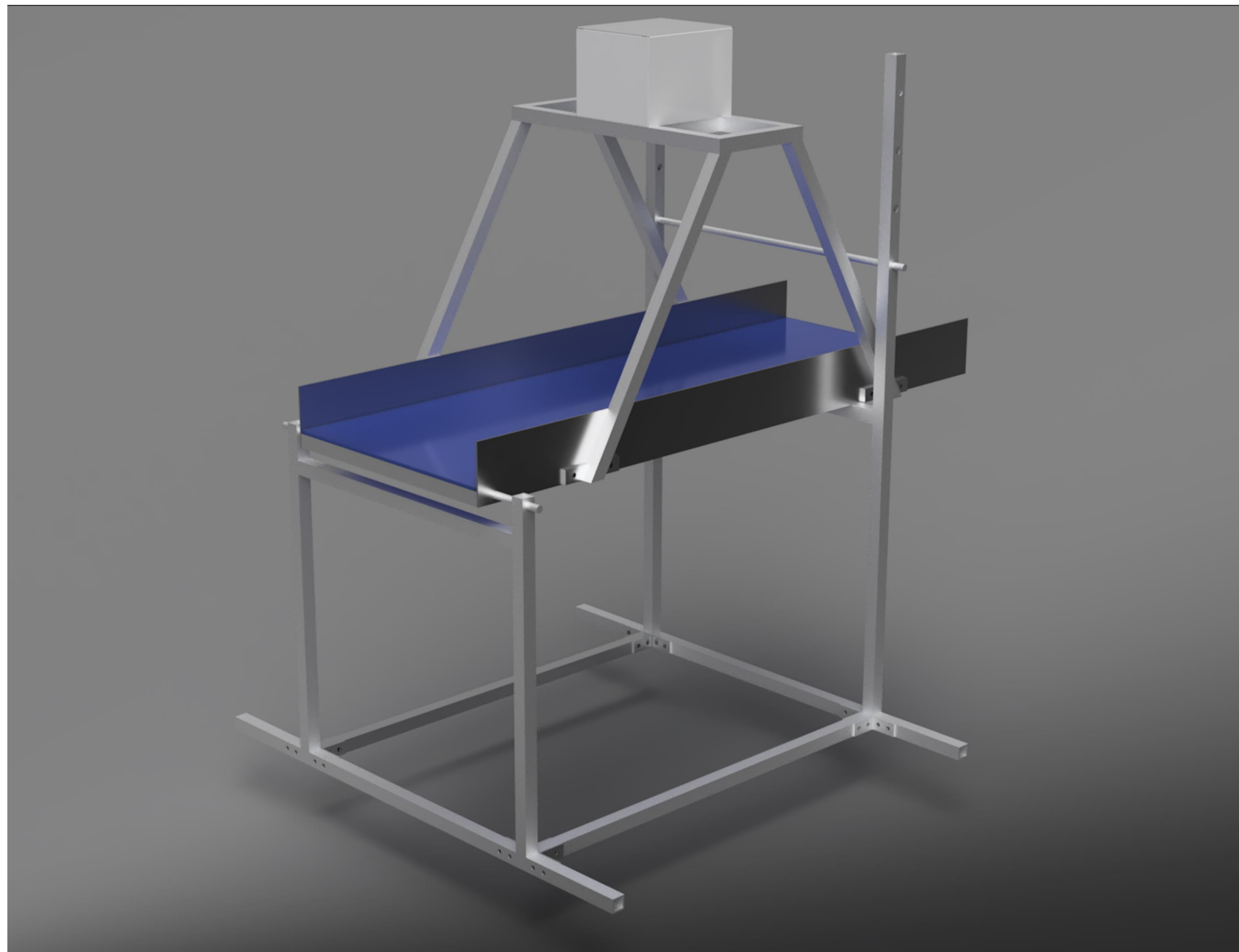
Data Management

- Lobster characteristics, such as carapace length and width, are used to determine grade
- Individual lobster data is associated with location, time, and fishing license to provide traceability

Verification

1. Able to process 1.2 lobsters per second
2. Weighs approximately 50 lbs. and can be disassembled in less than 10 minutes
3. Took pictures of lobster specimens with no recorded false readings
4. Visual inspection of lobster showed no shell damage after 20 trials
5. Accommodates lobsters that weigh 4 or more lbs. and can be up to 18 in. wide and 28 in. long
6. Operated by a single person with a laptop

References

1. Industry Overview. Nova Scotia Department of Fisheries and Aquaculture. Retrieved March 26th 2019
2. Controversial Bycatch Monitoring Program Coming to Maritime Lobster Industry. 2018. CBC News
3. Cheap at Sea, Pricey on the Plate: The Voodoo of Lobster Economics. Globe and Mail. 2017.

PROTOCASE