



# UAV PORTA-LAUNCHER



SAN DIEGO STATE UNIVERSITY



## Objective

To design a portable UAV Launcher for NAVWAR that is capable of launching a 2-meter wingspan Opterra UAV at various launch speeds and angles. The portability is measured by the products ability to be disassembled and kept in a Pelican brand 1770 case.

## How it works

- Elastic Spear-Gun bands are clipped into the Pulley-Rope system.
- The carriage is pulled back to pin-lock position, drawing tension in elastic bands and held in place by a fixed snap shackle.
- Drone is placed in launch position in the carriage cradle.
- Pin-pull system instantaneously releases tension via remote control of a stepper motor pulling the snap-shackle pin.
- Elastic bands retract pulling the rope around the pulleys and the carriage down the track until it meets an abrupt collision with the stoppers at the end of the track, ejecting the drone using its own momentum.

## Final Product Specs

- Collapses to fit in a Pelican 1770 case.
- Changeable launch speeds between 10 mph and 50 mph.
- Changeable launch angles between 10 and 30 degrees.
- Weighs 55 lbs.
- Can be set up by 2 people in under 12 mins.
- Launch can be triggered remotely or manually.
- Can launch off a variety of surfaces and in different environments.

## Meet the Team



Patrick Greene



Joseph Mazzeo



Ayendra Subasinghe



Fernando Casas



Austin Clements

## Sponsor

Dr. Anthony Jones  
Engineer at NIWC

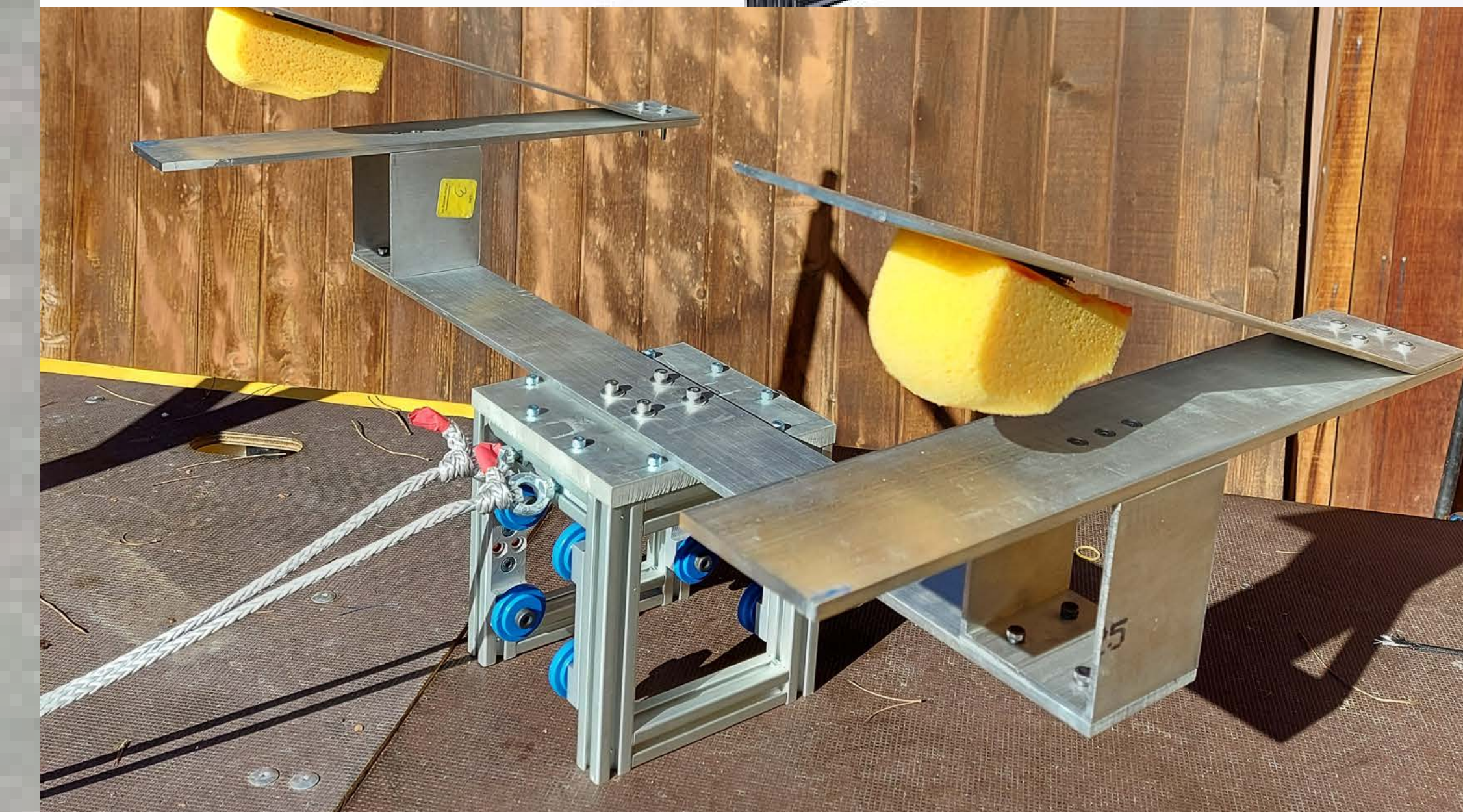
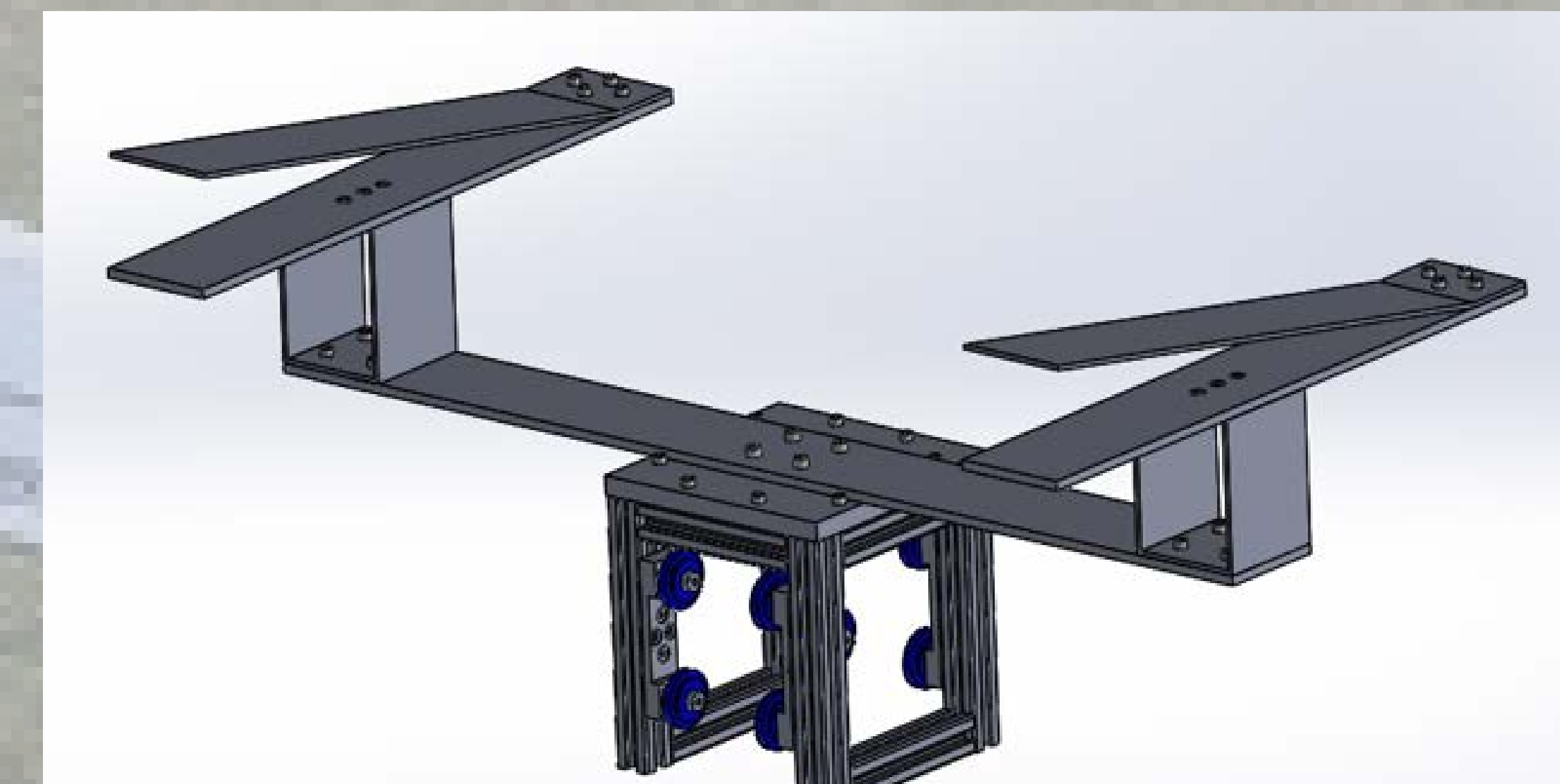
## Advisor

Dr. Alexander Lehman

Professor at SDSU College of Engineering

## Main System Components

- Track and carriage made of t-slot aluminum and nylon plastic components.
- Pulley system, L-brackets, damping system, and leg attachment were custom made using Aluminum 6061 and 7075 for high strength and low weight.
- Speargun bands and dyneema rope used to power system.
- ABS 3-D printed box with plexiglass cover to house electronics.
- Bipolar NEMA 17 Stepper motor.
- Arduino, L298N H-Bridge, IR Sensor, two voltage systems to drive stepper motor and Arduino independently.



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