

A nighttime photograph of a city street intersection. In the foreground, a tram with 'Azalia' branding is moving from right to left, creating a motion blur with red and white light trails. The street is paved with cobblestones and has tram tracks. A blue and white striped bollard separates the sidewalk from the street. On the left, a traffic light shows a green arrow for left turns, and a sign reads 'LEFT TURN ON ONLY' with a green arrow icon. Further back, a red traffic light is visible, and several cars are stopped. In the background, there are trees, streetlights, and buildings. One building on the right has a sign that says 'HOUSTON Methodist'. The sky is dark, and the overall scene is illuminated by city lights.

# Ronal Infante

M.S. INDUSTRIAL DESIGN  
2017-2018



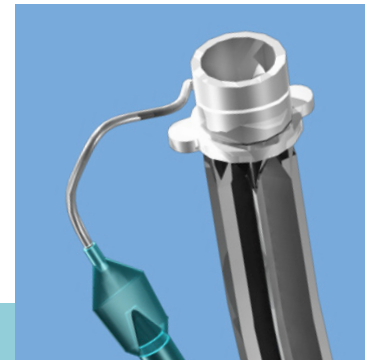
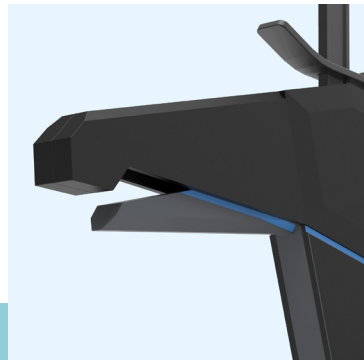
**TACT** 04

**PEAK** 14

**MDFR** 18

**STARK** 22

**TUBE MUCH** 34



## EDUCATION

**EXPECTED** **University of Houston, Houston, TX**  
DEC 2019 M.S. in Industrial Design

**AWARDED** **Rice University, Houston, TX**  
MAY 2016 B.S. in Bioengineering

## EXPERIENCE

**2016 - 2018** **Web Specialist, Human Resources**  
Rice University, Houston, TX

**2013 - 2015** **Freelance WordPress Developer**  
Houston, TX

## SKILLS

**LANGUAGES** **English:** Native Proficiency  
**Spanish:** Native Proficiency

**SOFTWARE** **Adobe:** Ps, Id, Ai, Pr  
**CAD:** SOLIDWORKS, KeyShot, AutoCAD  
**Microsoft:** Word, PowerPoint, Excel, Outlook  
**Web:** HTML5, CSS3, JavaScript/jQuery, PHP, WordPress, Drupal  
**Programming and scripting:** Arduino IDE, MATLAB, R, LabVIEW



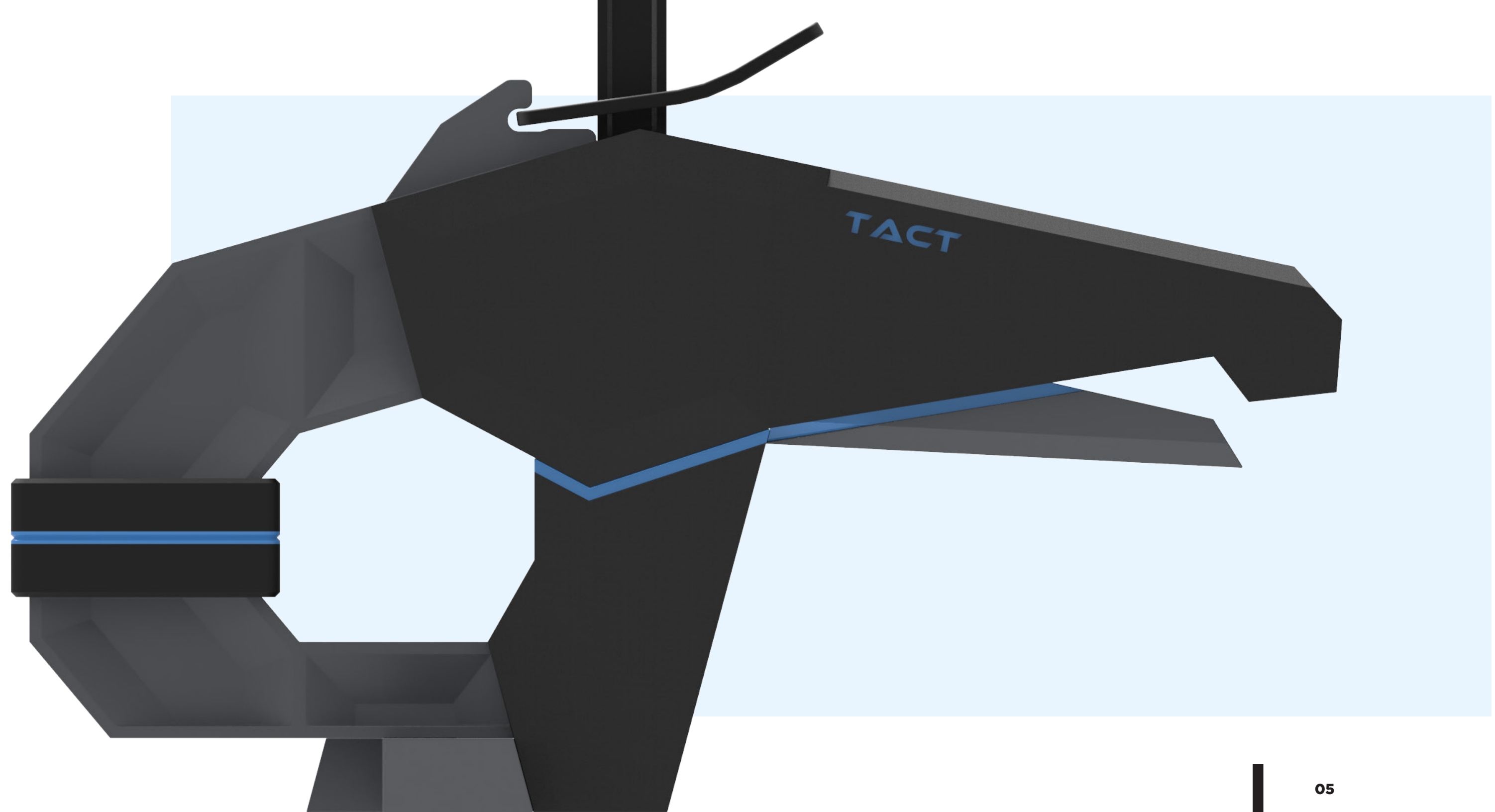
As a Bioengineer at Rice, I fell in love with design as a multidisciplinary tool for developing impactful products and solutions that change people's lives. I am currently pursuing a M.S. in Industrial Design in order to prepare me for a career as a **hybrid designer**.

I am an innovator trying to make the world a happier, healthier place by leveraging both software and hardware.

# TACT

## Bar Clamp

**INDS 6397: Studio**  
Spring 2018  
2 months



RESEARCH



USER OBSERVATIONS

When someone uses a bar clamp, they want their project to stay still.

Most users will either:

- clamp a piece to the edge of a table
- or struggle to keep a piece upright on the surface of a table or against a wall.

Users not familiar with bar clamps will struggle to figure out which leaver opens and closes the jaws.

TASK ANALYSIS

Sub Task	1. Measure & Prepare Assembly	2. Determine Clamping Locations	3. Determine Appropriate Clamp Size & Type	4. Open/Extend Clamp Using Release Lever	5. Press Handle Until Secure	6. Add Additional Clamps, If Necessary	7. Use Release Levers to Remove Clamps	8. Store Clamps
Scenario	Before clamps are used, the pieces to be clamped must be prepared.	The placement of the jaws should not damage the pieces, preferably should be a flat surface.	The user must decide which clamp is best suited for the project.	Clamp jaws must open to insert the assembly.	Clamp must be adjusted to a tight grip.	Often times, multiple clamps are required.	Clamps are removed from the assembly.	Clamps are put away when no longer in use.
Considerations	<ul style="list-style-type: none"><li>• Workspace</li><li>• Clamp size</li><li>• Size of pieces</li><li>• Shape of pieces</li></ul>	<ul style="list-style-type: none"><li>• <b>Jaw location</b></li><li>• <b>Jaw size</b></li><li>• <b>Clamping force distribution</b></li><li>• <b>Rubber jaws</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Bar length</b></li><li>• <b>Jaw size</b></li><li>• <b>Clamp size</b></li></ul>	<ul style="list-style-type: none"><li>• Extending jaws too far</li><li>• Lever placement</li></ul>	<ul style="list-style-type: none"><li>• Securing too tightly</li><li>• Lever placement</li></ul>	<ul style="list-style-type: none"><li>• Force needed</li><li>• Space available</li><li>• Budget</li></ul>	<ul style="list-style-type: none"><li>• Order of removal</li><li>• Lever placement</li></ul>	<ul style="list-style-type: none"><li>• <b>Clamp size</b></li><li>• <b>Clamp joinery</b></li><li>• <b>Clamp aesthetics</b></li></ul>
Pain Points	<ul style="list-style-type: none"><li>• May be lengthy and involved if not enough clamps are available or if pieces require complicated assembly</li></ul>	<ul style="list-style-type: none"><li>• Clamp may malform or fracture pieces</li><li>• Jaws may not fit</li></ul>	<ul style="list-style-type: none"><li>• Fan may not oscillate enough for an area</li><li>• Fan might need to be oriented in a specific way</li><li>• Fan may be too loud for an area</li></ul>	<ul style="list-style-type: none"><li>• Air may not be blown in the desired orientation</li><li>• Too much air may be blown in a direction</li></ul>	<ul style="list-style-type: none"><li>• Fan may not provide immediate relief</li><li>• Fan may not get strong enough</li><li>• Fan may not cover enough areas</li></ul>	<ul style="list-style-type: none"><li>• Fan may be too big to leave out</li><li>• Fan may be too ugly to leave out</li><li>• Fan may be too heavy to move</li></ul>	<ul style="list-style-type: none"><li>• Fan may not oscillate enough for an area</li><li>• Fan might need to be oriented in a specific way</li><li>• Fan may be too loud for an area</li></ul>	<ul style="list-style-type: none"><li>• Air may not be blown in the desired orientation</li><li>• Too much air may be blown in a direction</li></ul>
	Starting Work			During Work			Completing Work	

DESIGN DIRECTION

A clamp that stands on its own is missing from the market and could provide a unique advantage to users.




Critical features:

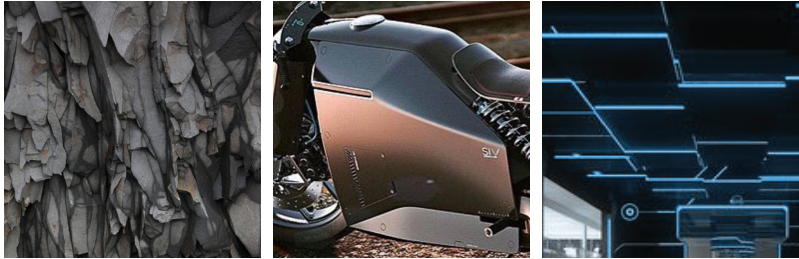
- large jaw relative to overall dimmensions
- compatible with other clamps
- important components highlighted



BRAND LANGUAGE

Understated  
Angled  
Chamfered  
Matte Finish

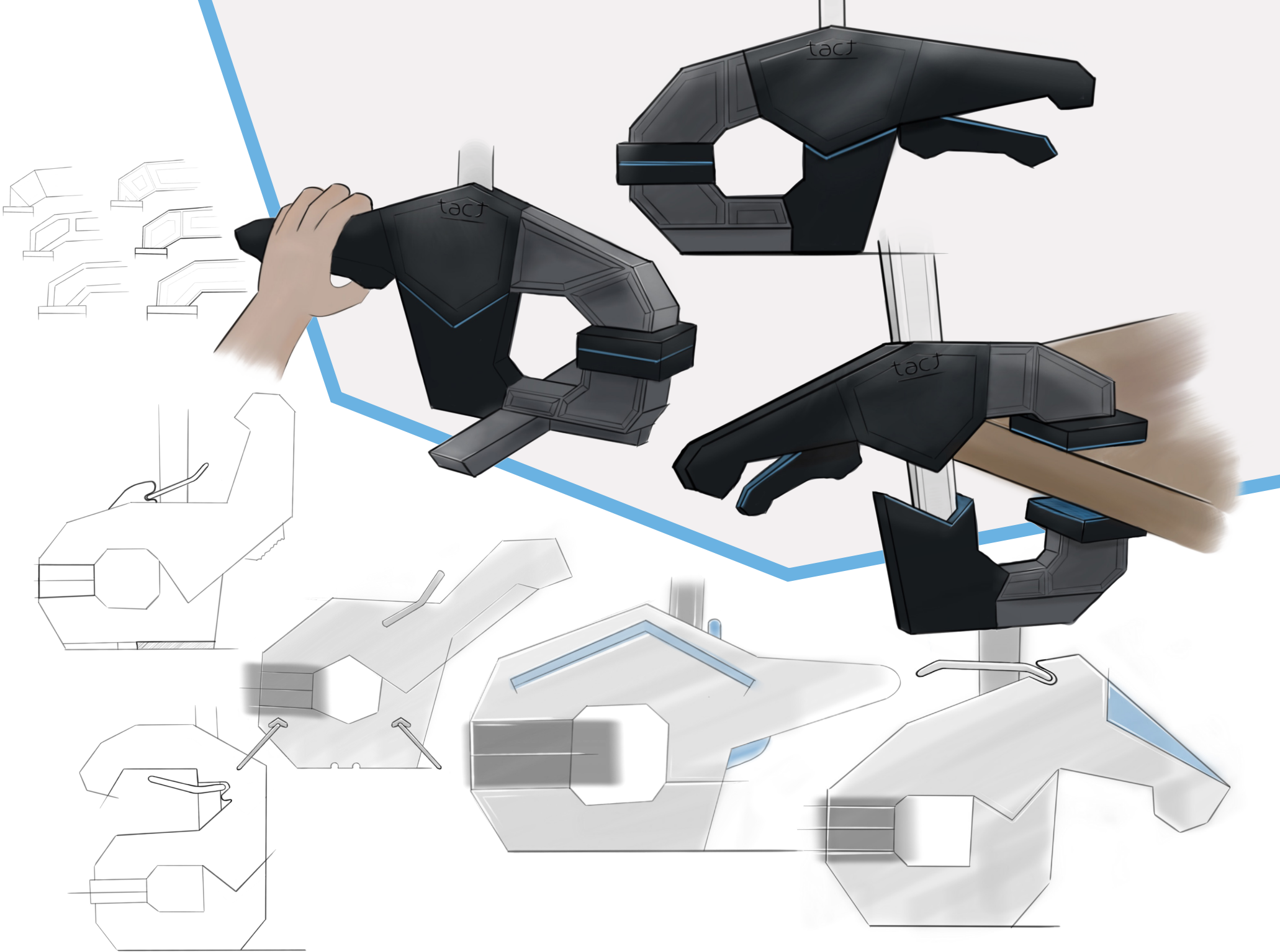
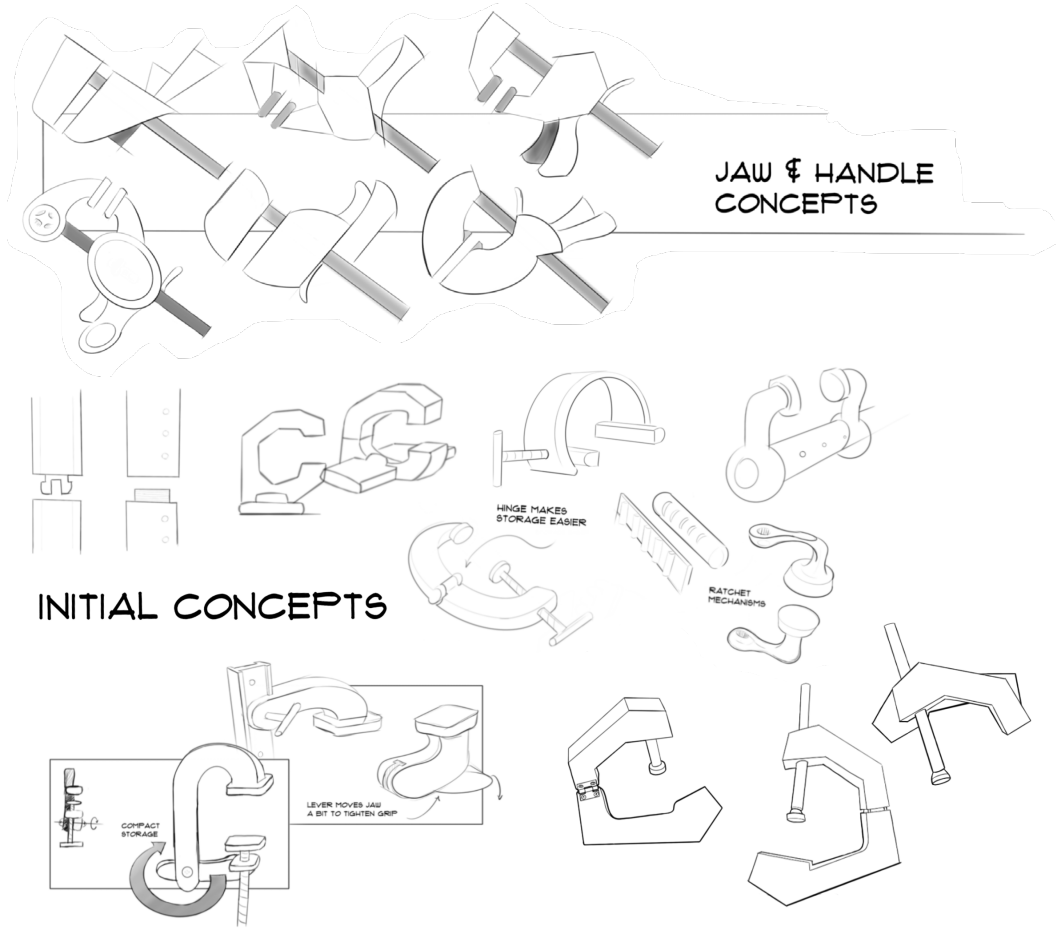
-  PANTONE 292 C  
CMYK 54 16 0 0  
#6DB2E2
-  PANTONE Cool Gray 11 C  
CMYK 63 53 48 21  
#5F6267
-  PANTONE Black 6 C  
CMYK 82 71 59 75  
#101820



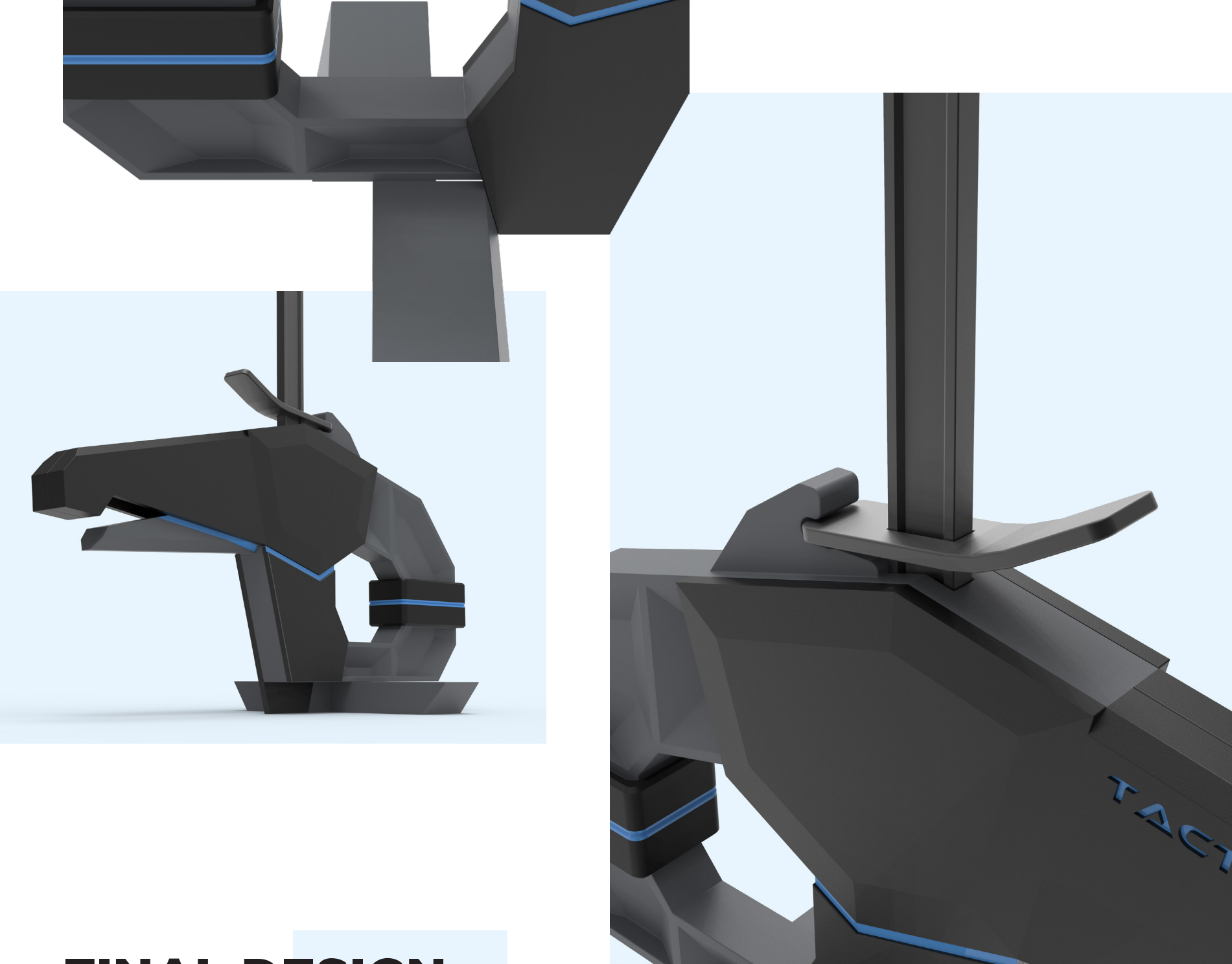
TACT

/takt/  
noun  
  
adroitness and sensitivity  
in dealing with others or  
with difficult issues.

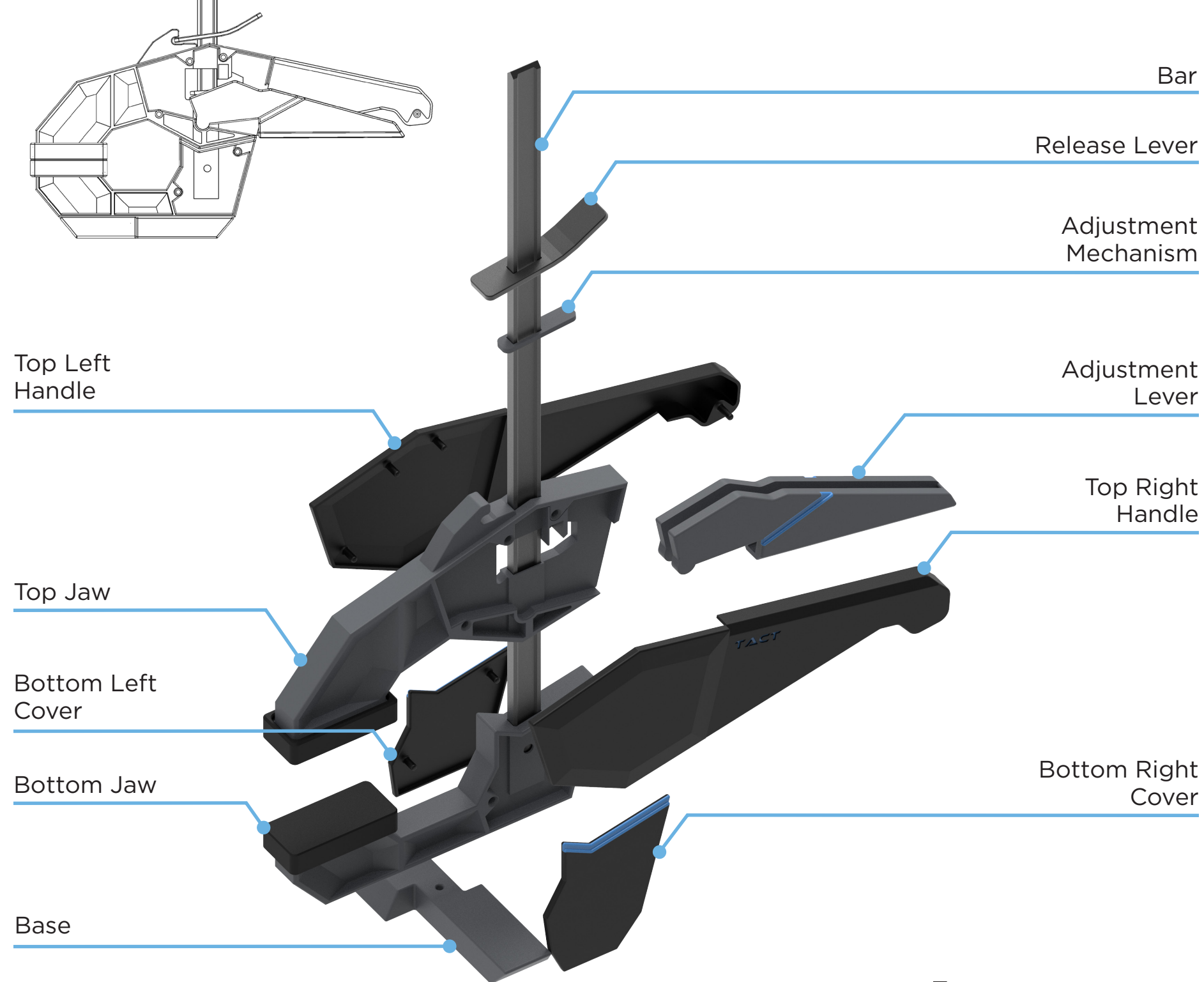
IDEATION





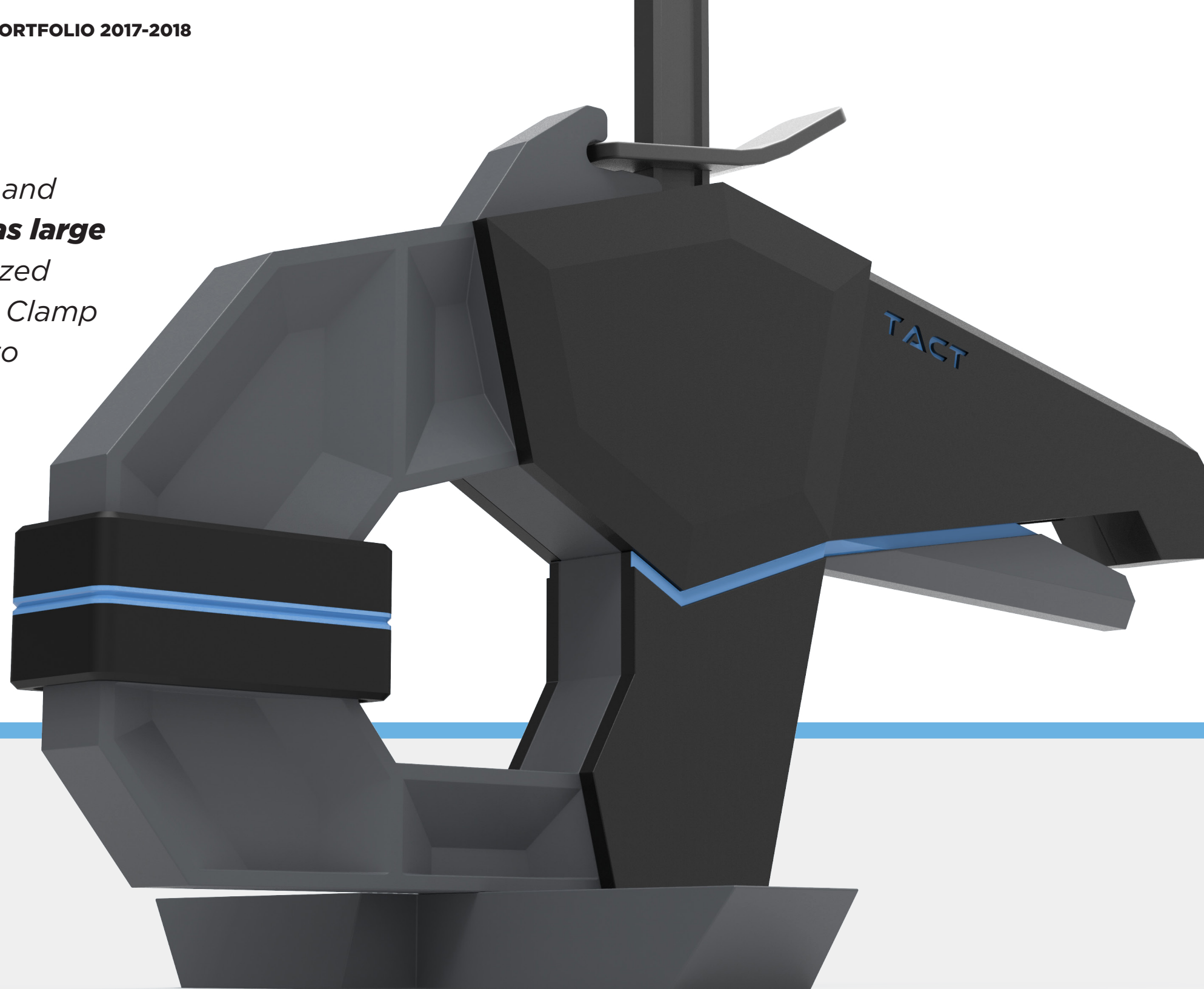


**FINAL DESIGN**





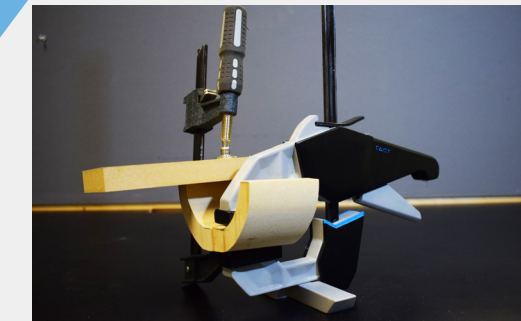
With its **swivel base** and **jaws that are twice as large** as that of similarly sized clamps, the Tact Bar Clamp brings finesse back to your workspace.



No hassle table-top clamping is possible by swiveling the base to the perpendicular position.



Swiveling the base back to the parallel position allows you to use the Tact clamp as a regular clamp, both on table surfaces and table edges.



The Tact clamp is unobtrusive to other types of clamps. It is a valuable addition to any arsenal of tools.

# TACT

## Bar Clamp

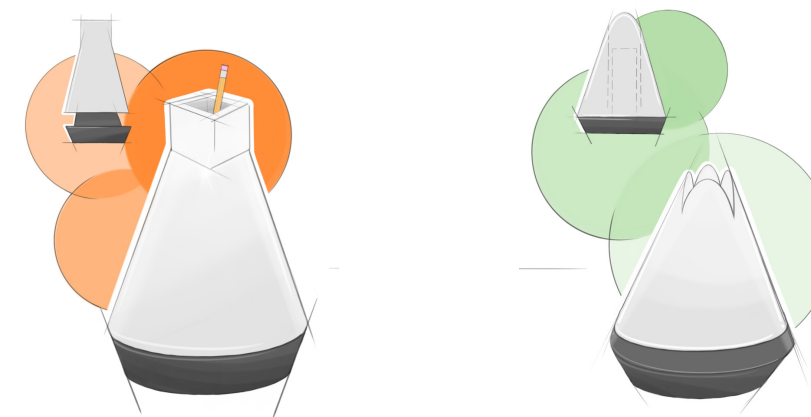
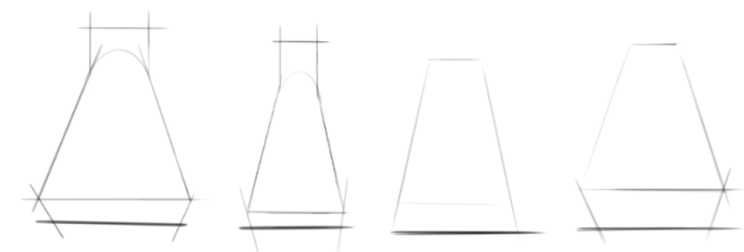
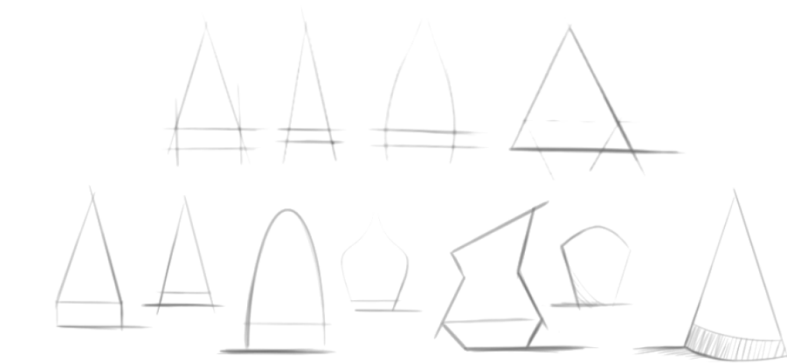


# PEAK

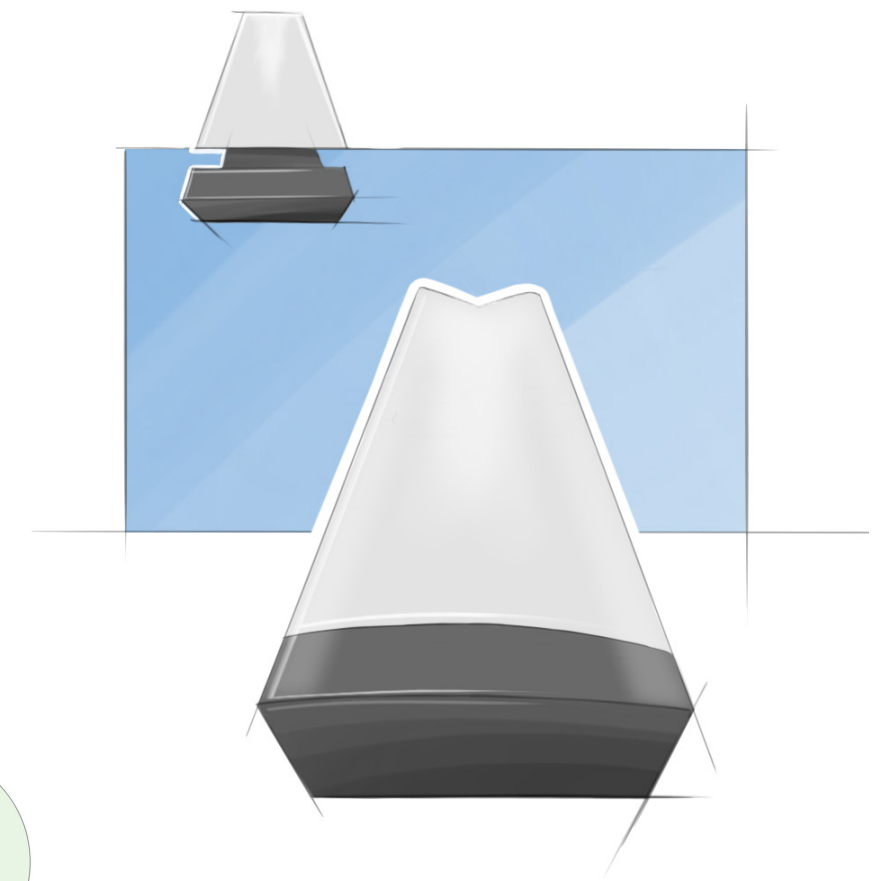
*material exploration,  
vacuumed formed ABS and cast urethane*



**INDS 6397: Materials & Methods**  
Fall 2017  
1 month

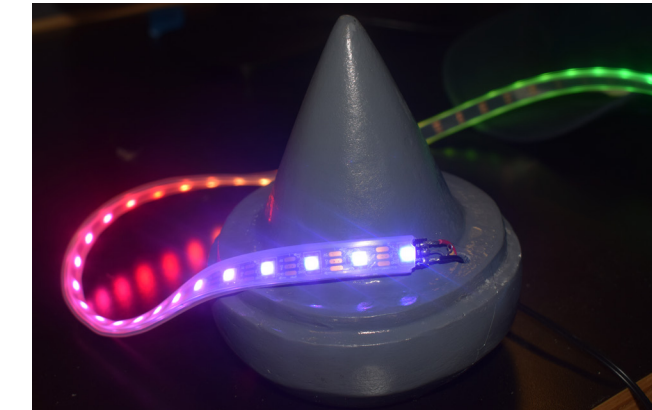
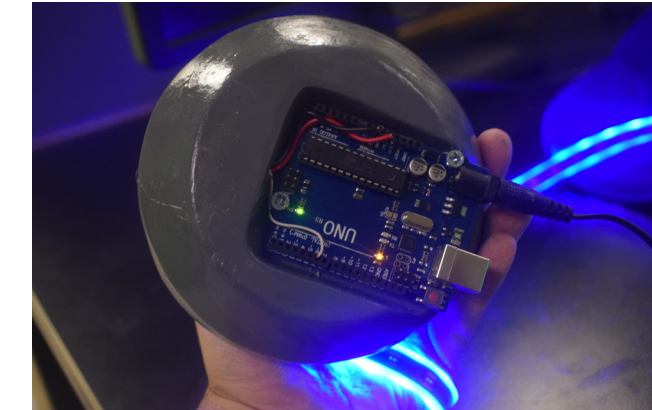
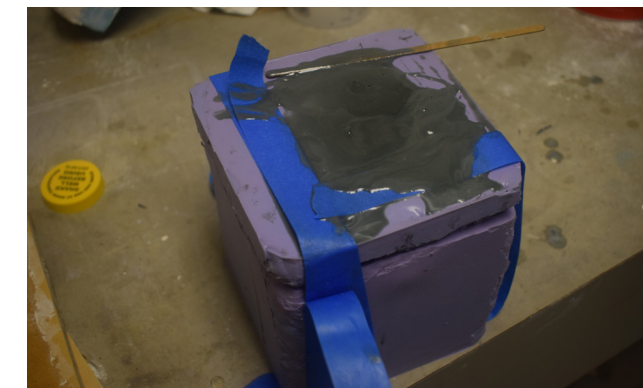
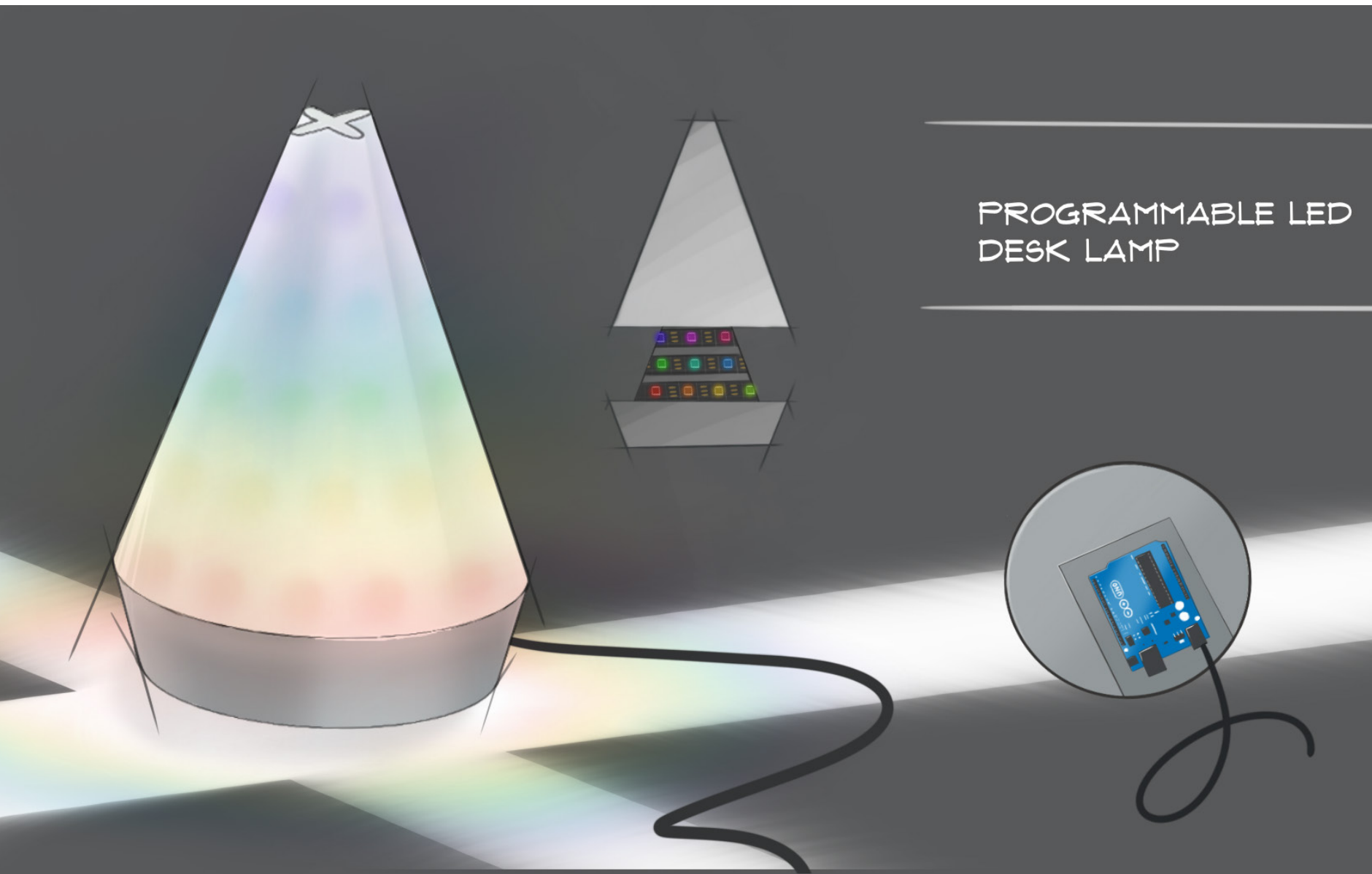


## INITIAL IDEATION





# FINAL DESIGN



# EXECUTION & ASSEMBLY



# MIKE'S DANCE FLOOR RENTALS

"Mike's Dance Floor Rentals is Houston and Austin's portable dance floor specialist providing different styles of stunning dance floors for Texas events, big and small."

## FREELANCE WORK

2014, 2015  
1 month, in parts

*"Ron's work was professional, timely, and creative. In the two years since Ron developed our website our business has tripled in revenue due largely to our SEO placement and the ease in which customers find what they need. We could not be more pleased."*

*- Mike Reed, Client*

## STYLE GUIDE



### Mike's Dance Floor Rentals

Font: Museo Slab

Menu Item • Menu Item

Mobile Menu Item



### Headline 2

This is a text link

### Headline 3

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce est ligula, commodo faucibus lacus quis, hendrerit ornare nibh. Donec rutrum ex sed lectus maximus interdum. Mauris at facilisis turpis, vitae faucibus mi.

Font: Open Sans

Learn More



Transparent



Greyscale



B&W

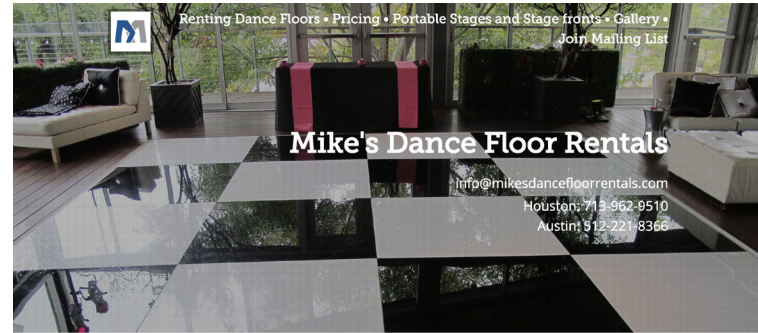


B&W Inverted



On Color

## DESKTOP



Mike's Dance Floor Rentals is Houston and Austin's portable dance floor specialist providing different styles of stunning dance floors for Texas events, big and small.

## Natural Oak Dance Floors



Mike's carries a large inventory of high quality Sico Natural Oak finished floors and can supply dance floors 12' x 12' to 57' x 57' or any size in between, indoors or outdoors\*.





**INDS 6397: Studio**  
Spring 2018  
2 months



The *stark tower fan* is a bold, modern alternative to the mass-produced feel of the \$30-40 fan market. It boasts simpler interactions and a broad body of air to bring the focus back to what matters, keeping you cool.



# RESEARCH

A competitor analysis and task analysis guided concept generation.



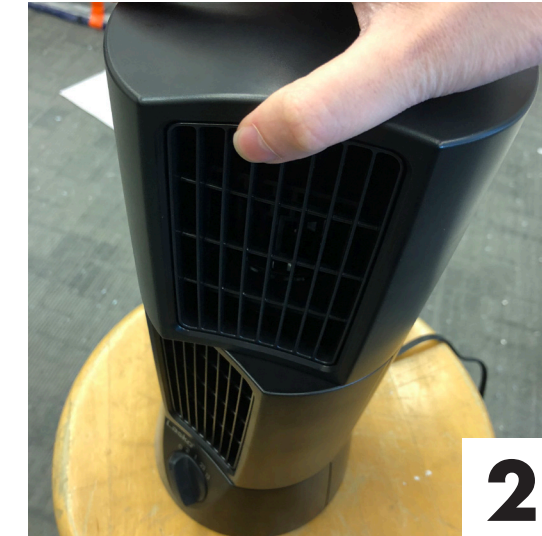
## Lasko® 14-Inch Oscillating Mini Tower Fan

**\$24.88**

- 2 speed settings
- Pivoting top module
- Integrated carry handle
- Multi-directional oscillation
- Timer setting
- Measures approximately 6in x 6in x 14in



**1**



**2**



**3**



## Holmes® 14-Inch Oscillating Mini Tower Fan

**\$24.99**

- 2 speed settings
- Top mounted control panel with rotary dial
- Integrated carry handle
- Multi-directional oscillation
- Measures approximately 6in x 5in x 15in



## Oscillating Mini Tower Fan

**\$25.90**

- 3 speed settings
- LED indicators
- Integrated carry handle
- Multi-directional oscillation
- Timer setting
- Measures approximately 7in x 7in x 14in



As part of the competitor analysis, we purchased the Lasko® Tower Fan. There were 3 major issues we found with it:

1. The dial was too close to the bottom and the dial's grip was too small, causing hand strain.
2. The pivoting modules had to be manually placed into a static position. They did not move individually and had to be readjusted if a different angle was desired.
3. The cord management was basic.

We then dissassembled the fan in order to reverse engineer our individual designs.



## BRAND LANGUAGE

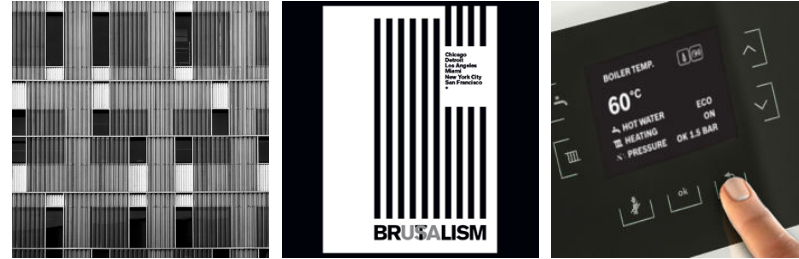
Repetition  
Height  
Curvature  
Rotation  
Brutalism

PANTONE 19-0303 TCX  
CMYK 4 6 0 82

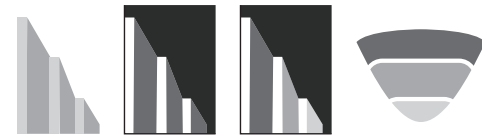
PANTONE PQ-18-0503TCX  
CMYK 0 1 1 59

Injection molded  
Polypropylene (PP)  
Profax 6323

Stone finish  
MT-11010



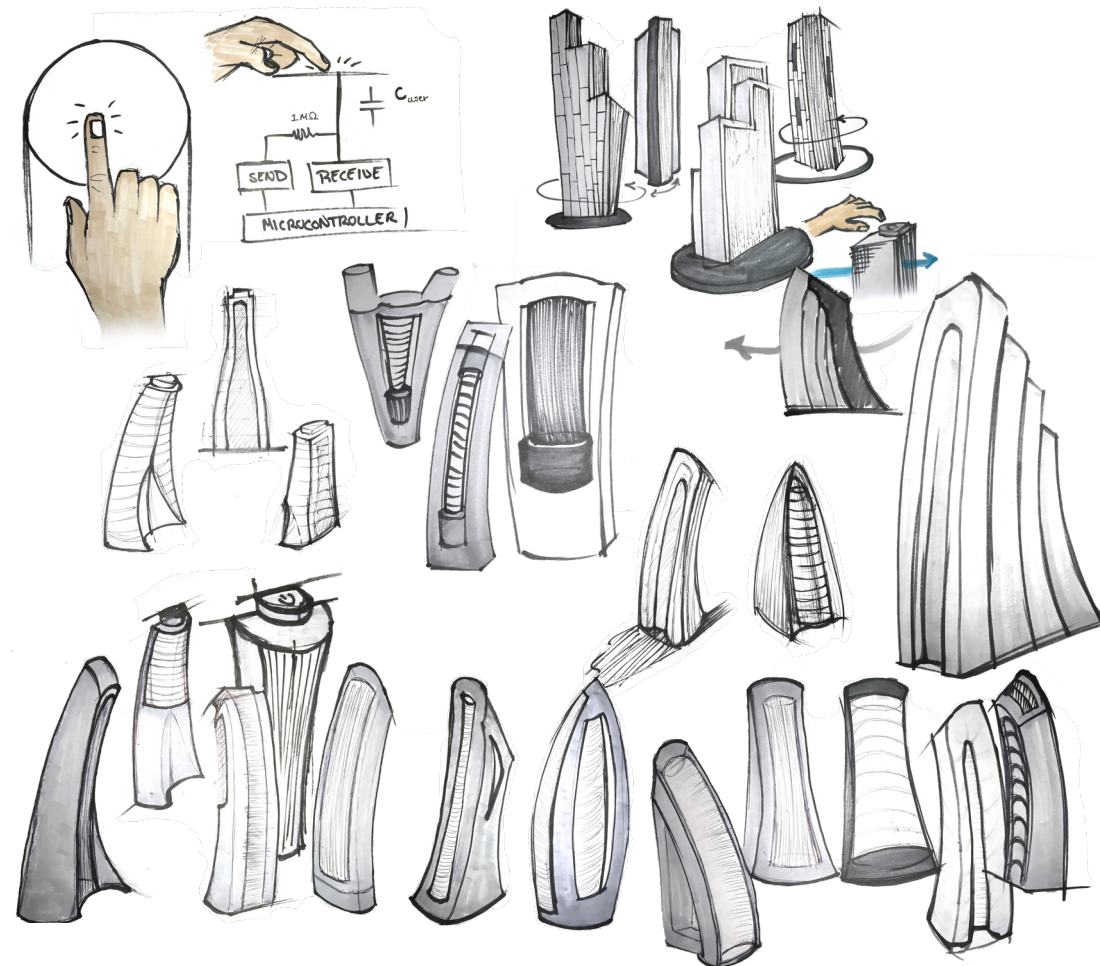
## LOGO DESIGN PROCESS



/stärk/  
adjective  
severe or bare in  
appearance or outline.

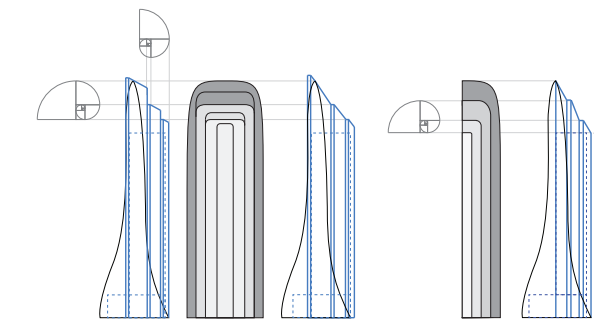
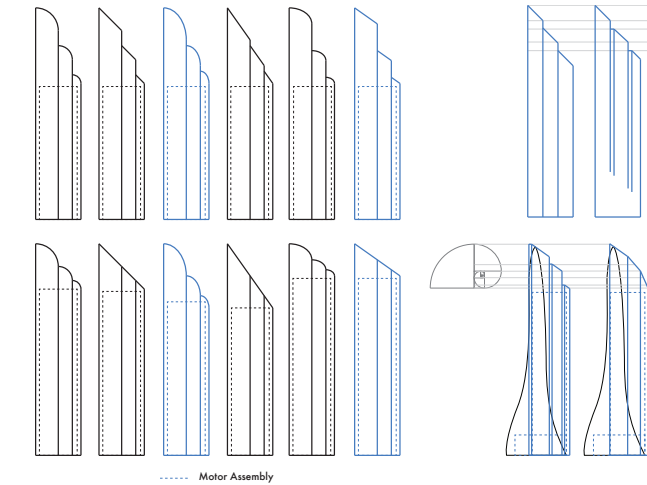


## IDEATION

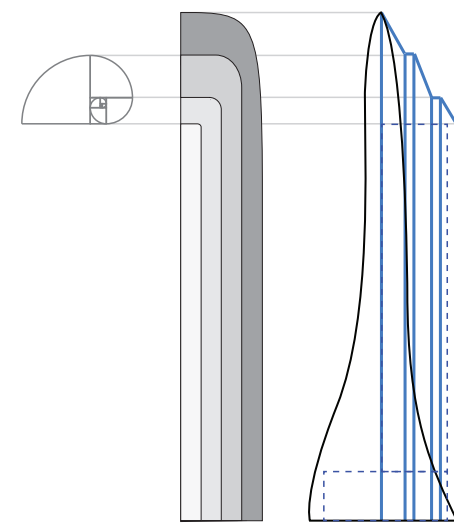
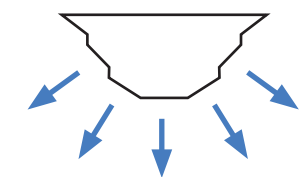


My colleagues at work use table-top fans in their offices so I made foam models at various scales to demonstrate my concepts to them. A majority of them indicated that most other fan outlets were too narrow and produced a small body of air.

This feedback guided my refinement.



Wide body of air



The golden ratio provided a pleasing relationship between the heights of the 3 button ridges.



# FINAL DESIGN



## Material Specs - All Housings

Injection Molded  
Profax 6323 Polypropylene  
MT11001 Finish

PANTONE 19-0303 TCX  
CMYK 4 6 0 82

PANTONE PQ-18-0503TCX  
CMYK 0 1 1 59

Back Outer Housing

Back Inner Housing

1.8in Diameter Fan Blades

Standard 12VDC Motor

6 Capacitive Sensing Buttons

Capacitive Sensor &  
Microcontrollers PCB

Front Outer Housing

Front Inner Housing

4in Diameter  
Stationary Base

Oscillating Housing Base



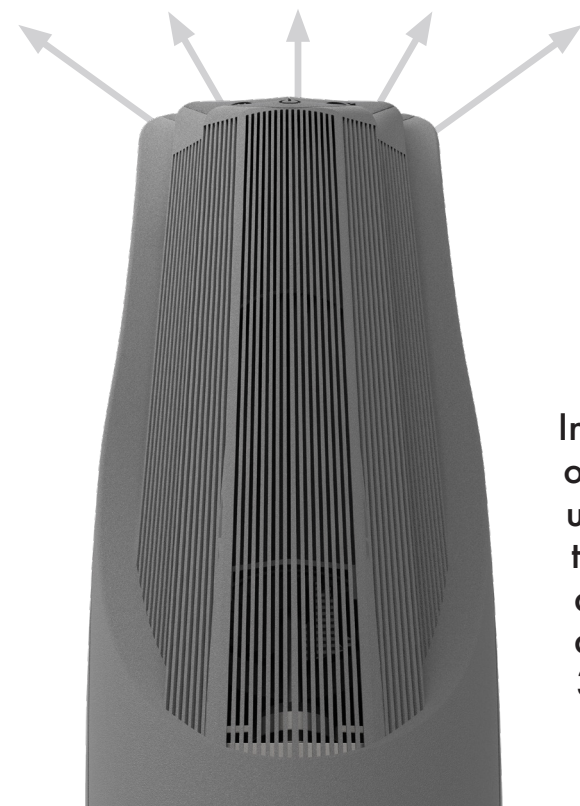
Bringing better interactions, functionality, and aesthetics to the \$30-40 market.



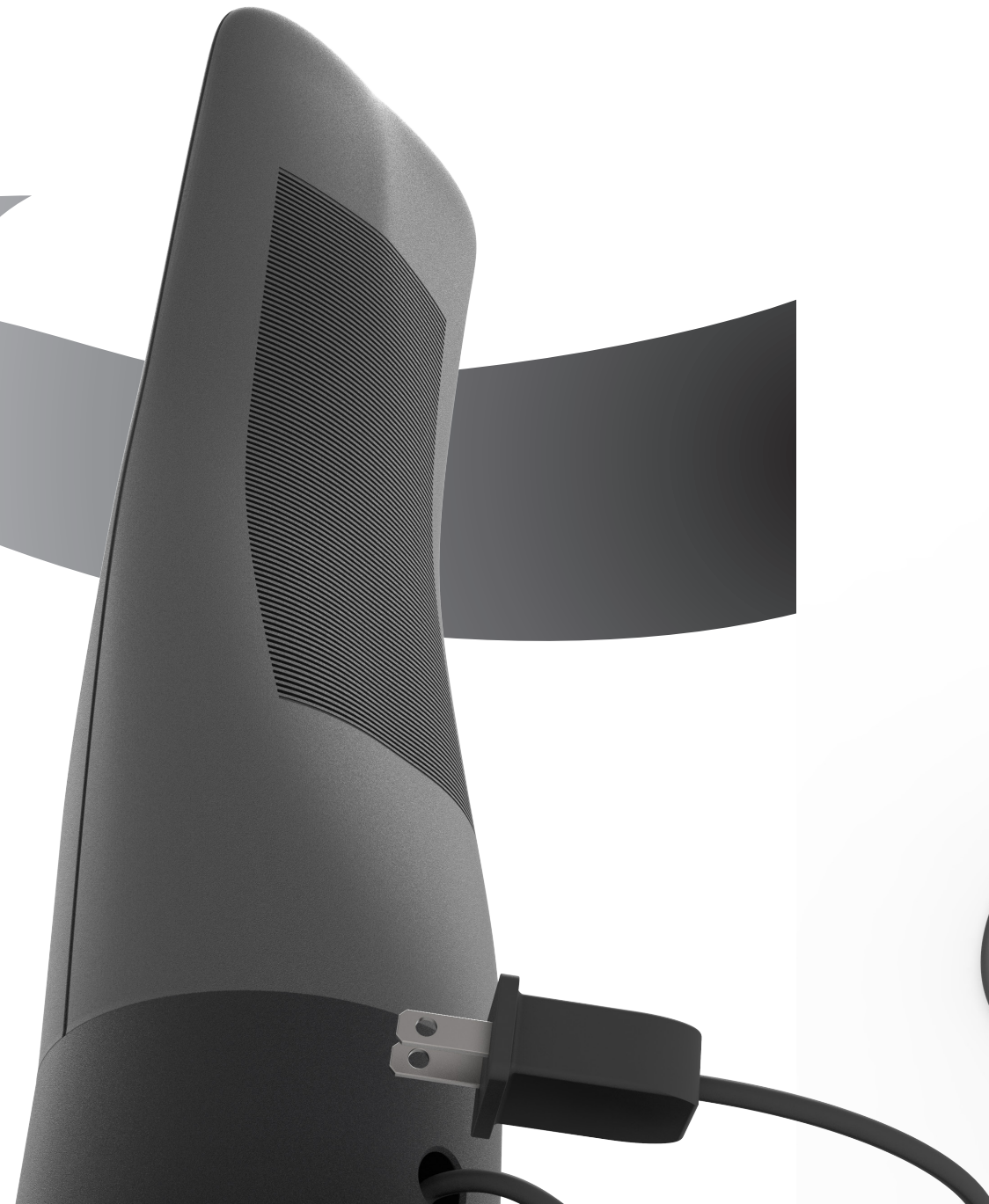




The capacitive sensing buttons use the body's natural bioimpedance to trigger speed, oscillation, and to turn the fan on/off.



In addition to oscillation, the unique geometry of the vents releases a wide body of air at exact angles of 30°, 60°, and 90°.



 **stark**  
tower fan



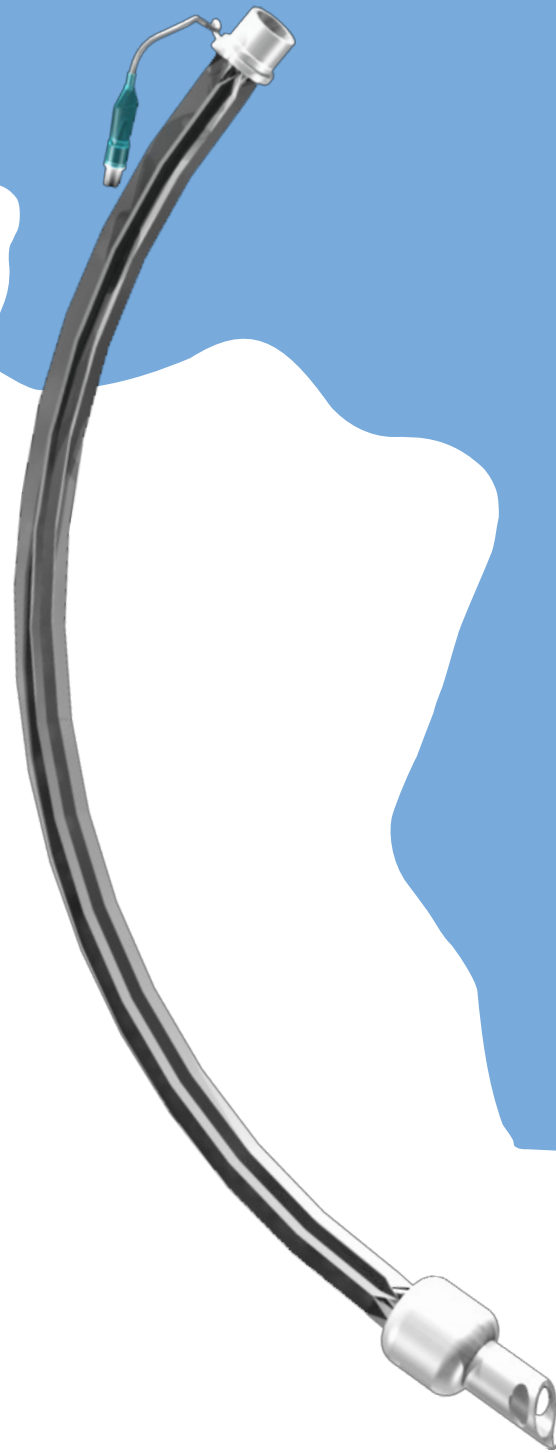
# TUBE MUCH: A Radially Collapsible Endotracheal Tube

GROUP PROJECT,  
Fall 2015/Spring 2016

Department of Bioengineering,  
Rice University, Houston, TX 77005



Engineering Capstone  
Design  
2015-2016  
1 year



TUBE  
MUCH

- Every person who undergoes a surgical procedure must be intubated. During intubation, an endotracheal tube (ETT) is inserted into a patient's trachea to administer general anesthesia or ventilate the lungs during surgery.
- Current ETTs compromise between diameter and airflow, resulting in large diameters that impair visibility surrounding the device.
- No major modifications have been made to current ETTs in over 50 years.

## OUR GOAL:

To design a novel endotracheal tube (ETT) that eases the process of intubation and improves patient outcomes.





# 51.7 million intubations

are performed annually in the US<sup>1,2</sup>

## 10.3%

experience complications<sup>3</sup>

# 5.3 million complications

need to be addressed



PHOTO COUTESY OF  
© LUXE STUDIO PRODUCTIONS

## DESIGN CONSTRAINTS INCLUDE:

- Diameter of the trachea and vocal cords
- Amount of air required by the lungs
- Threat of puncture in trauma patients
- Low cost of standard ETTs

## TO REACH OUR GOAL, WE HAD TO MEET THE FOLLOWING NEEDS:

- Improve visibility during intubation
- Increase airflow to the patient's lungs
- Simple to use
- Resistant to puncture
- Similar in dimensions and features to standard ETTs
- Comparable in cost to standard ETTs
- Biocompatible and sterilizable

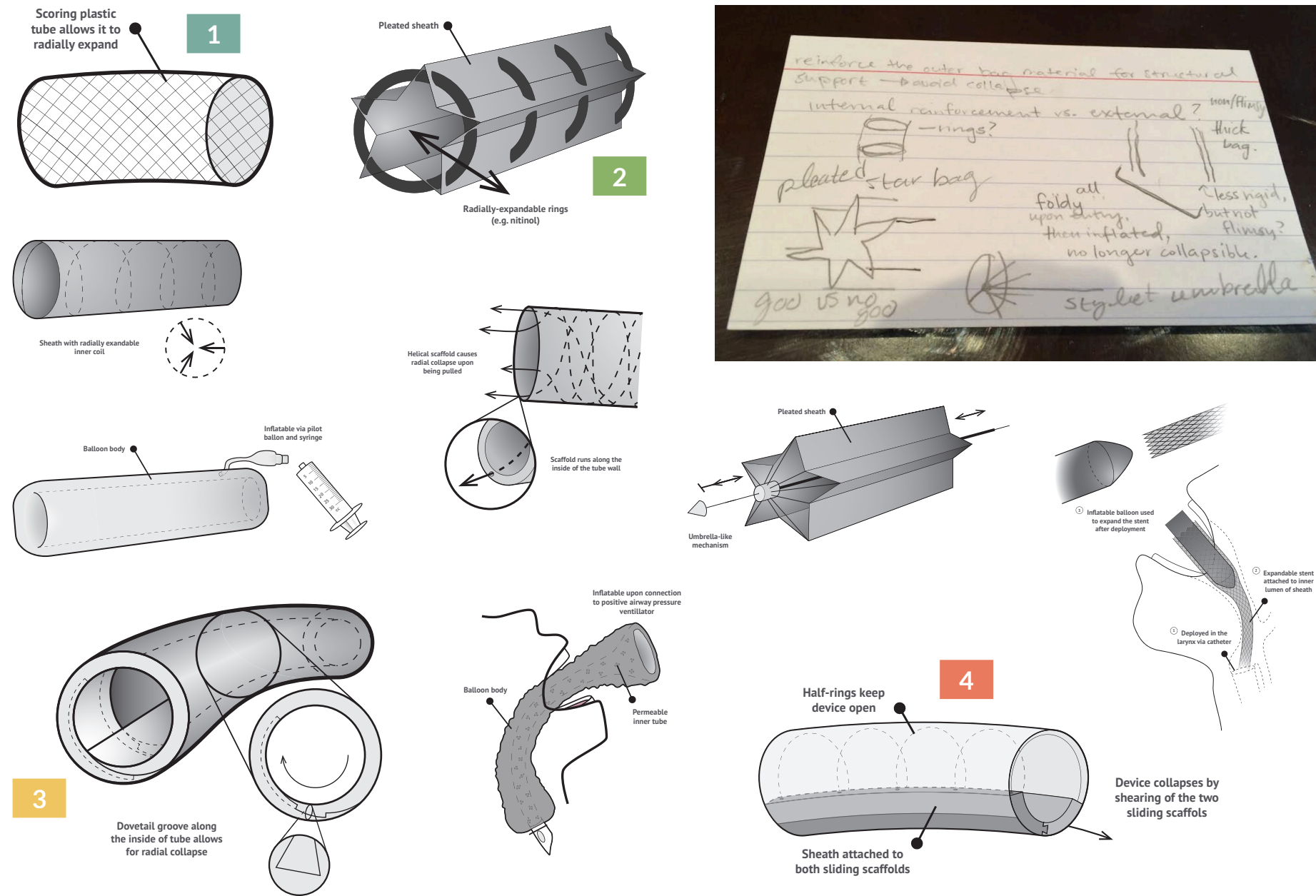


WHICH TRANSLATE TO THE FOLLOWING SPECIFICATIONS:

Specification	Competitive Value	Ideal Value
Visible Area in Trachea	3.5 cm <sup>2</sup>	3.9 cm <sup>2</sup>
Tidal Volumes	1 L	1.3 L
Ease of Use	3/5 on survey	3/5 on survey
Hardness	Shore 85A	Shore 85A
Dimensions	L=35cm; d=8mm	L=35cm; d=10mm
Cuff Pressure	25 cmH <sub>2</sub> O	25 cmH <sub>2</sub> O
Price	\$3	\$3
Biocompatibility	Comparable to PVC	Comparable to PVC
Sterility	SAL < 10 <sup>-6</sup>	SAL < 10 <sup>-6</sup>

\*SAL: sterility assurance level

THE SPECIFICATIONS GUIDED OUR CONCEPT GENERATION

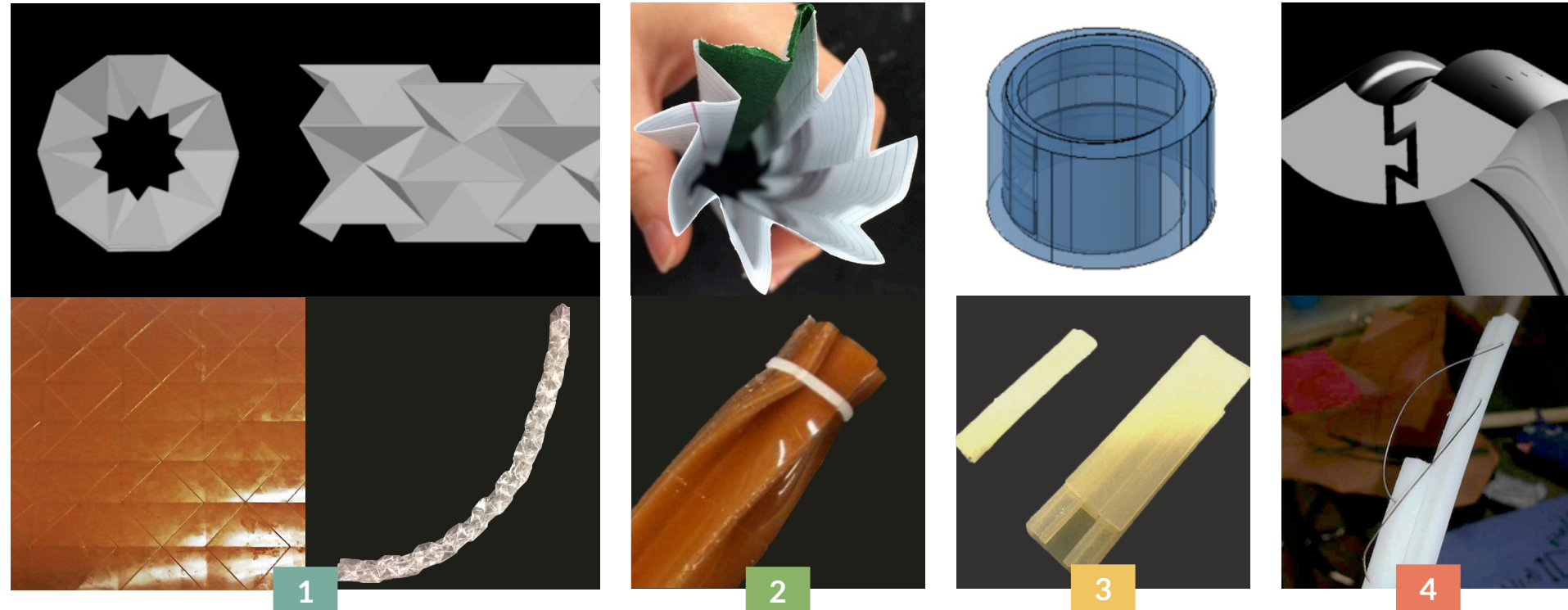




## RAPID PROTOTYPING & REFINEMENT

We produced various proof-of-concept prototypes over the next few months. Producing to-scale prototypes was a major challenge for us. Although some of the concepts we generated were very innovative, we had to move forward with designs that could be prototyped at 10mm in diameter, using the resources available to us, and within budget.

Some of our prototypes are shown below:

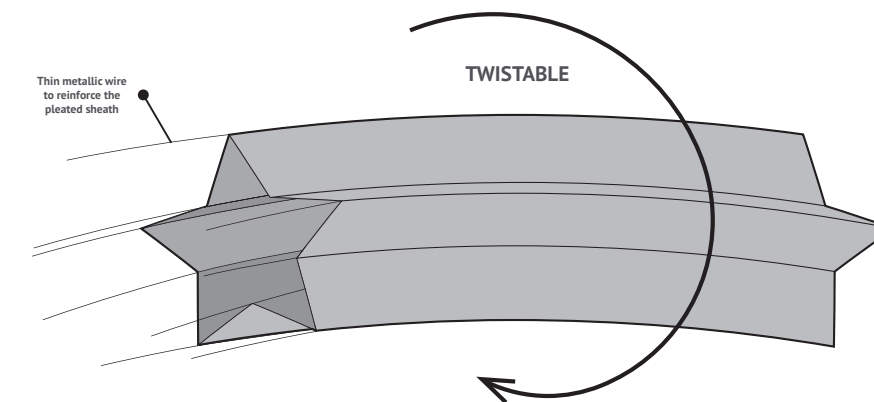


## AN EPIPHANY

Our project sponsor, Dr. Jonathon Jundt, brought us a sample of Mylar, which is a thin, metallic-coated polyester film known for its high tensile strength and being inert.

We thought it would be the perfect material to use as a pleated sheath to replace the standard polyurethane tube. After experimenting with the material, we learned it was very flexible and would behave similar to a bag.

We came up with one final concept:

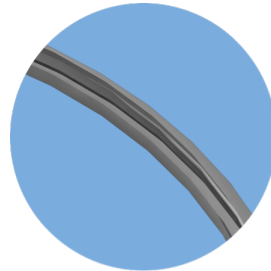






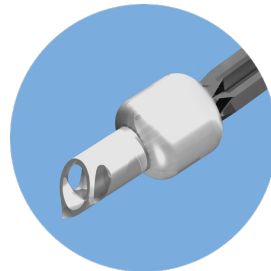
### Machine Connector & Pilot Balloon

Connects to ventilator to ventilate the lungs and fills the cuff, respectively.



### Collapsible Mylar Midsection

Twistable, puncture-resistant Mylar with metal wire reinforcement allows for dynamic behavior.



### Murphy's Eye, Cuff, & Beveled Tip

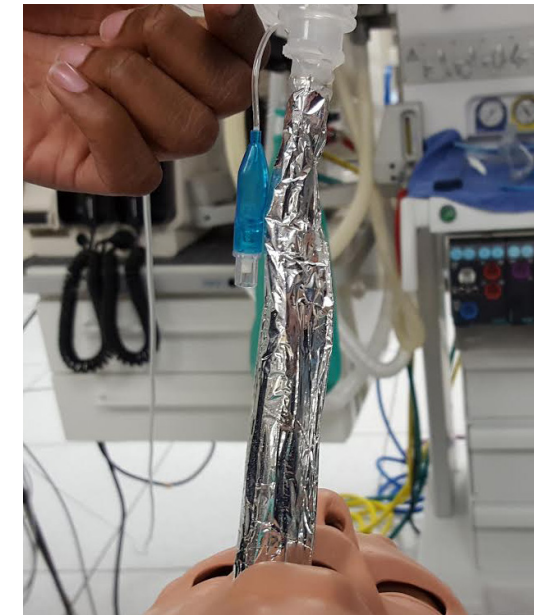
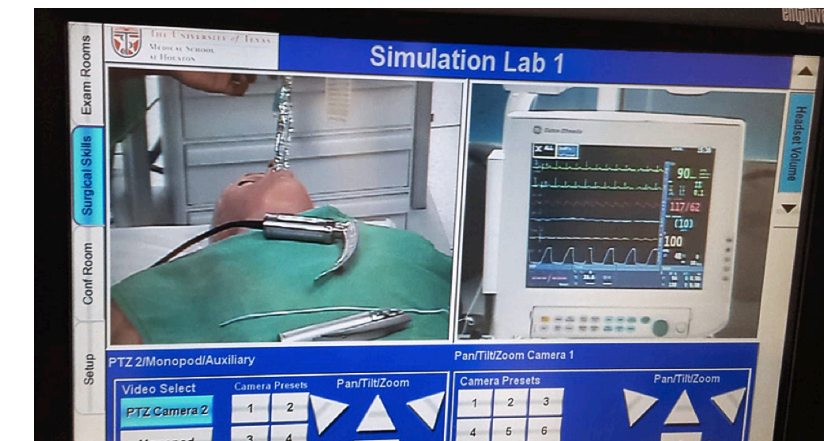
Prevents blockage of airflow, seals away fluids, and aids in visualization, respectively.

# PATENT PENDING

## TESTING



With the help of UTHealth Medical School, we measured tidal volume using a Laerdal SimMan®.

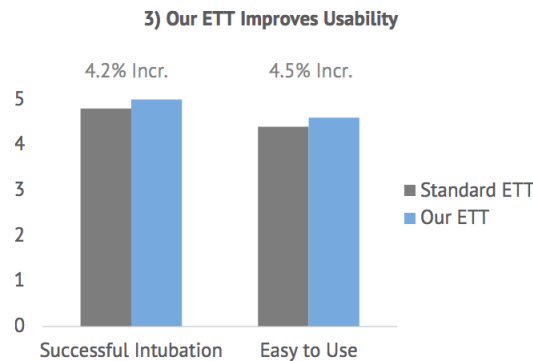
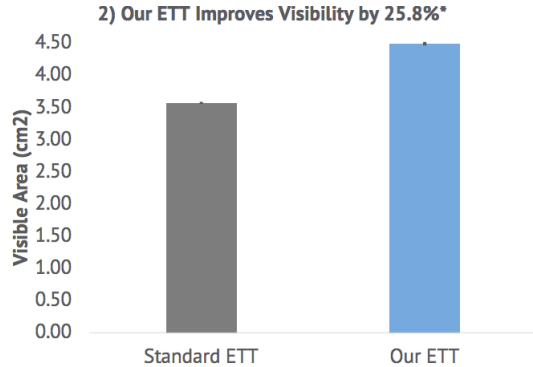
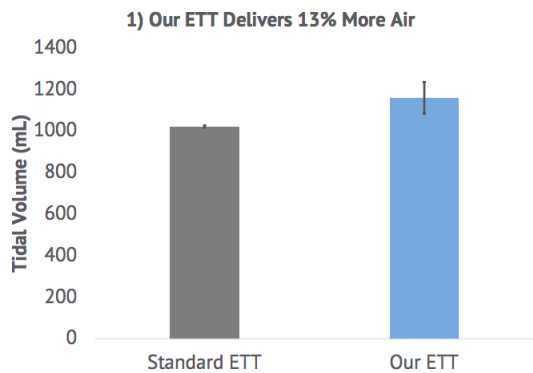


Our ETT successfully lodged inside the larynx of the SimMan



RESULTS & CONCLUSIONS:

DESIGN CRITERIA		
Objective	Target	Measured
Improvement in visibility	25%	25.8%
Improvement in tidal volume	33%	13%
Hardness	Shore 80A <sup>4</sup>	Shore 92A <sup>5</sup>
Cost	\$3	\$4.46



- 1) Measured using a Laerdal SimMan® anesthesia simulator.
  - 2) Calculated based on the difference between cross-sectional areas of the trachea and the ETT; assumed circular anatomy.
  - 3) Determined via IRB-approved survey of experienced clinicians following intubation.
- \* Note: Error bars too small to be seen.



AWARDS

- Best Design Poster, APR 2016**  
*Rice Bioengineering Bay Area Design Showcase*
- Excellence in Capstone Engineering Award, APR 2016**  
*Rice University School of Engineering Design Showcase and Poster Competition*
- Best Group Project in the School of Engineering, APR 2016**  
*Rice Undergraduate Research Symposium*

REFERENCES

- [1] “The World Medical Market Report 2003: Current Trends and Future Prospects.” Espicom Business Intelligence. Espicom Business Intelligence, 2003. Web. 25 Sept 2015.
- [2] “US Anesthesia and Respiratory Products Markets.” Frost & Sullivan Research Service. Frost & Sullivan Research Service, 10 Jan 2003. Web. 25 Sept 2015.
- [3] Martin, Lizabeth D., et al. “Outcome Study.” Anesthesiology 55.4 (2011): 182.
- [4] “Continuous Airway Control.” Vivasight. ETView Medical Limited, n.d. Web. 25 Sept 2015.
- [5] Mylar polyester film. “Physical-Thermal Properties.” DuPont Teijin Films, Web. June 2003.



## SUPPLEMENTAL WORK: SOLIDWORKS & KEYSHOT



## SUPPLEMENTAL WORK: SKETCH RENDERING

