SHITIJ "TIJ" VISHWAKARMA

MS. OCEAN ENGINEERING

BS. AEROSPACE ENGINEERING

FLORIDA TECH

TIJVISHWA.COM

GITHUB.COM/SHITIJ-V

LINKEDIN.COM/IN/TIJV

(321) 503-2943

SVISHWAKARMA2015@MY.FIT.EDU

Online Portfolio

HTML5 | CSS3 | JavaScript

WHAT?

- TijVishwa.com: Online portfolio to highlight and showcase all my achievements, certifications, resume, and contact details in one place
- Detailed discussion about the process and the results for every project/experience
- Seamless interactivity and accessibility across all platforms

RESULTS

- A seamlessly responsive and interactive website that can be accessed through any device, through any web-browser
- Professional UI & UX
- A one-stop place that highlights my achievements and serves as a repository that can be updated at any time

HOW?

- Learned HTML, CSS, and JavaScript from scratch to implement concepts like:
  - PopState & PushState Events
  - Hashing
  - Media Queries,
  - Pseudo-Classes and Pseudo-Elements,
  - Light-mode and Dark-mode implementation,
  - Object Comparison,
  - Callback Functions,
  - Immediately Invoked Function Expression (IIFE), and
  - Transition Effects
  - Interactive Project Timeline
- Almost 6,000 lines of code in WebStorm to pull it all together
- Bought the domain name, the security certificates, and a hosting server to live-host the website online

SHITIJ "TIJ" VISHWAKARMA

MS. OCEAN ENGINEERING

BS. AEROSPACE ENGINEERING

FLORIDA TECH

TIJVISHWA.COM

GITHUB.COM/SHITIJ-V

LINKEDIN.COM/IN/TIJV

(321) 503-2943

SVISHWAKARMA2015@MY.FIT.EDU

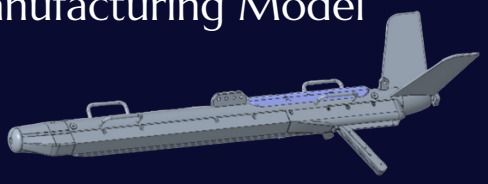
Towfish CFD Analysis

KLEIN MARINE SYSTEMS, INC. | Ansys FLUENT | STAR-CCM+ | Simerics, Inc. TECHNOLOGY BY DESIGN | creo

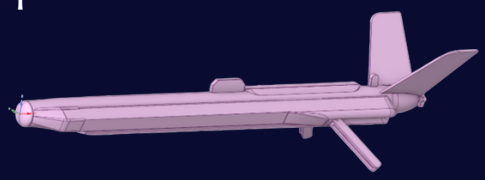
WHAT?

- Performed CFD hydro-stability analysis on Klein 600 sidescan sonar
- Computed and verified the results across ANSYS Fluent, Simerics MP, and Star-CCM+
- Suggested stability improvements in design to get rid of turbulent areas
- Reran the stability analysis to verify the validity of the suggested changes

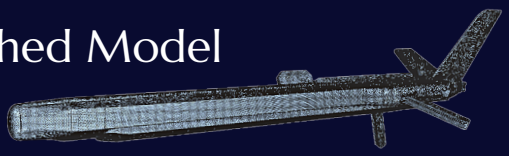
Manufacturing Model

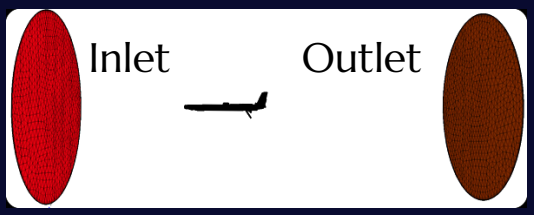


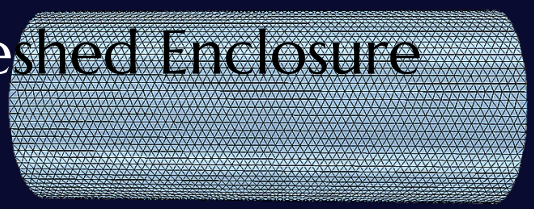
Simplified CFD Model



Meshed Model

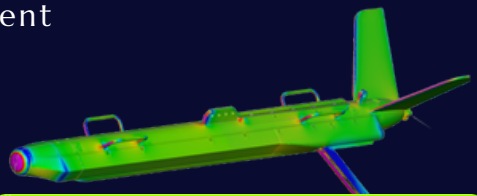


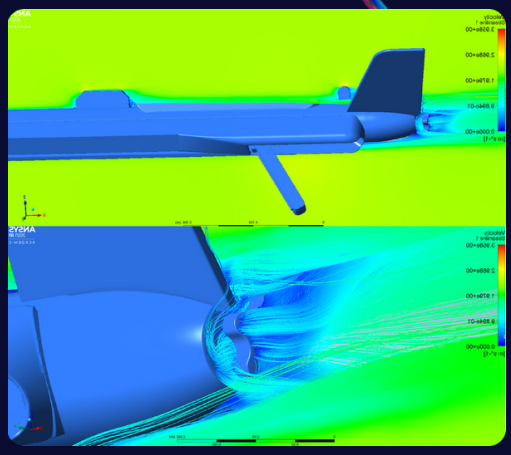




HOW?

- Imported manufacturing CAD model in the aforementioned CFD software
- Replicated the working environment with the appropriate external forces on all three CFD software
- Collected the stability data and force data
- Compared this data across the three CFD platforms and verify the results
- identified the turbulent areas for improvement





RESULTS

- All three CFD platforms gave satisfactorily similar results
- Turbulent areas identified to the tow-point, the sidescan whiskers, and the tail-cone cap
- Drag value at 5 knots identified to be 55 Newtons and the lift to be about 13 Newtons

SHITIJ "TIJ" VISHWAKARMA

MS. OCEAN ENGINEERING

BS. AEROSPACE ENGINEERING

FLORIDA TECH

TIJVISHWA.COM

GITHUB.COM/SHITIJ-V

LINKEDIN.COM/IN/TIJV

(321) 503-2943

SVISHWAKARMA2015@MY.FIT.EDU

Scientific Cruise - r/v W.T. Hogarth

KLEIN MARINE SYSTEMS, INC | FLORIDA TECH | JW FISHERS

WHAT?

- Four days, three nights onboard W.T. Hogarth
- Deployed various sea probes: Magnetometer, Sonar, Underwater ROV.
- Taking scientific readings and analyzing them
- Five deployments in total: two in the Tampa Bay area, one out in the deep ocean, two in the Dry Tortugas

HOW?

- Onboarded at Tampa Bay and Offboarded at the Florida Keys
- Coordinated with the ship captain to choose points for deployment and seabed scanning
- Deployed Klein 600 sonar to search for interesting underwater structures and then deployed the BlueROV2 to take pictures and live video of the same

RESULTS

- Learned the maritime code of conduct
- Learned in-sea deployment and retrieval of all the probes
- Learned team management through coordination with 16 students to select tasks during each activity: assigning key roles like deployment team, retrieval team, data collection team and course-correction team

SHITIJ "TIJ" VISHWAKARMA

MS. OCEAN ENGINEERING

BS. AEROSPACE ENGINEERING

FLORIDA TECH

TIJVISHWA.COM

GITHUB.COM/SHITIJ-V

LINKEDIN.COM/IN/TIJV

(321) 503-2943

SVISHWAKARMA2015@MY.FIT.EDU

Planing Boat-Hull Regression Analysis

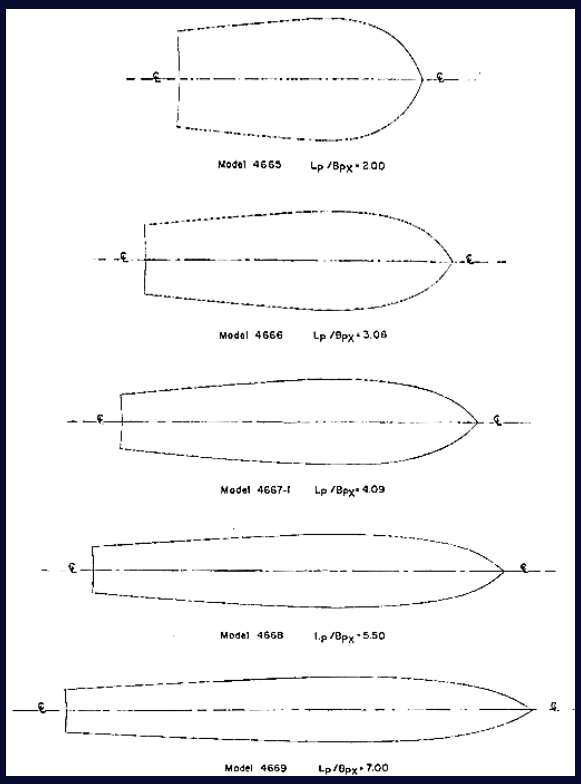
FLORIDA TECH | TIBCO Statistica | MATLAB

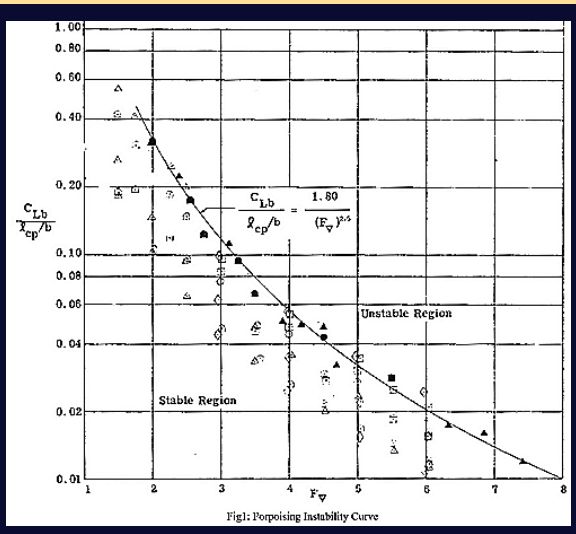
WHAT?

- Statistical regression analysis of planing boat hulls presented in the "Resistance Tests of a Systematic Series of Planing Hull Forms" (Clement & Blount, 1963) [Series 62]
- The equation devised generalizes their experimental process to provide an analytical, more generalized take.
- One equation encapsulates the entire experimental process

HOW?

- Used the Rosenbrock & Quasi-Newton Non-Linear Optimization approach for convergence to formulate a generalized equation that would best fit the experimental results from Clement & Blount, in Statistica 12.4.
- Digitized close to 7000 points to achieve the best available data from the experimental graphs.
- Wrote the program in MATLAB for calculations and graphing purposes.



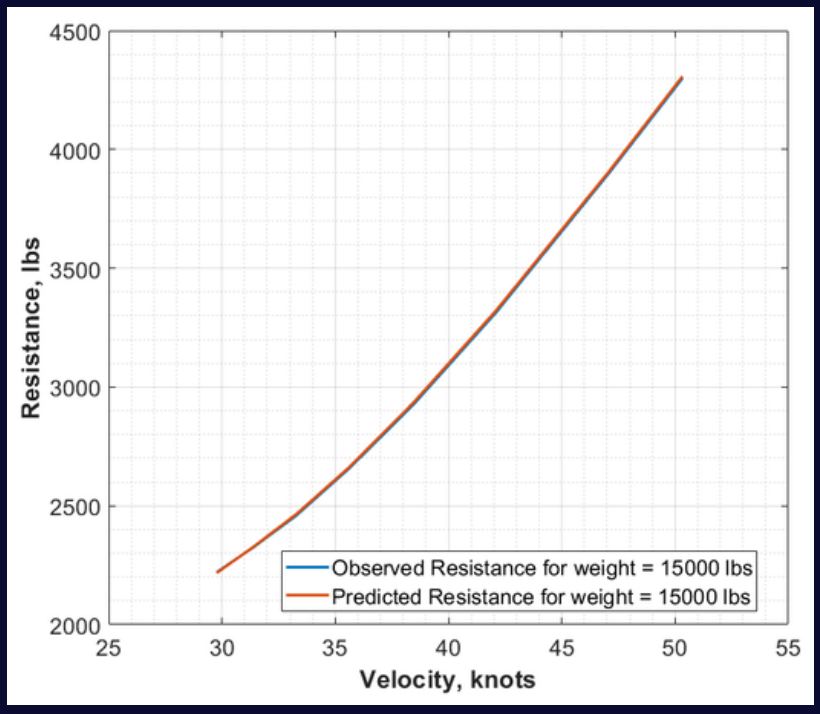


RESULTS

- Formulated equation:

$$\frac{R}{W} = a0 + \frac{(a1 * W^{a2}) + (a3 * (CLB)^{a4})}{a5 * (\frac{LCP}{B})^{a6}}$$

Variable	Value
R	Total Resistance, lb.
W	Displacement at rest weight of the boat, lb.
CLB	Lift coefficient, $W/(\frac{1}{2}\rho u^2 b^2)$
LCP	Distance of center of pressure forward of transom, ft.
B	Beam over chine, excluding external spray strips, ft.



SHITIJ "TIJ" VISHWAKARMA

MS. OCEAN ENGINEERING
BS. AEROSPACE ENGINEERING

FLORIDA TECH

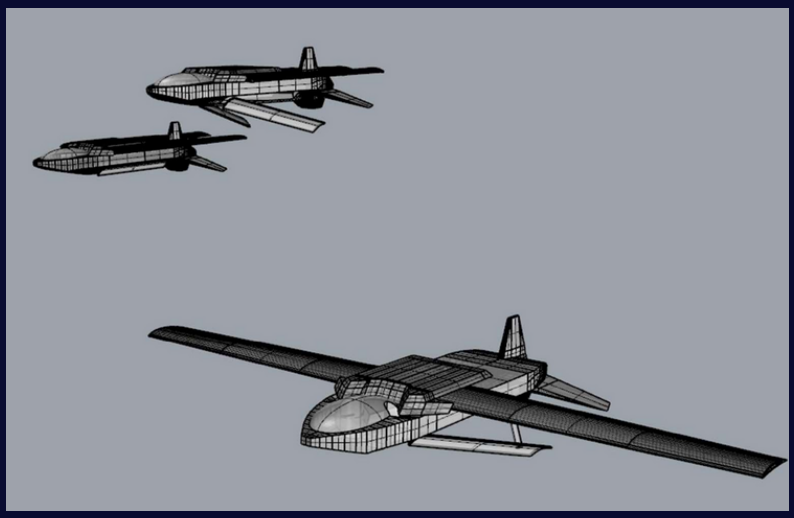
TIJVISHWA.COM
GITHUB.COM/SHITIJ-V
LINKEDIN.COM/IN/TIJV
(321) 503-2943
SVISHWAKARMA2015@MY.FIT.EDU

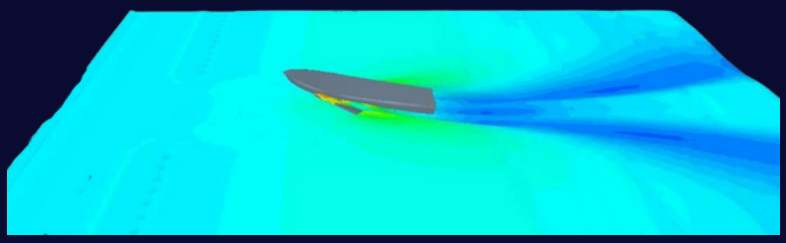
The Flying Fish Amphibious Vehicle

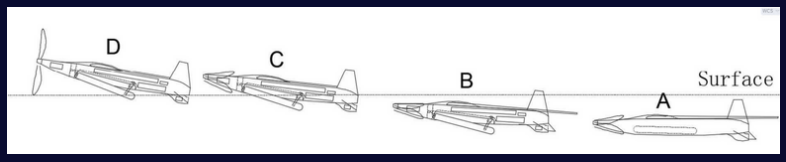
FLORIDA TECH STAR-CCM+ WMTC18

WHAT?

- Bridged the gap between air and sea travel through amphibious drone tech
- Reduced the time in search and rescue, and reconnaissance
- Designed a convertible UAV to SSV to AUV (complete amphibious drone cycle).
- Continue to develop the Nautilus technology







HOW?

- Manipulating the COG via dynamic ballast tank
- Converting between a UAV and to AUV through COG manipulation
- Retractable wings to decrease the underwater drag
- Dual Propulsion system -foldable air propellers and an underwater submarine propeller

RESULTS

- **2nd place at the 6th Maritime World Technology Conference --Student Showcase**
- Successfully achieved 5knots in water
- Successfully incorporated retractable wings
- Successfully integrated a working dynamic ballast tank

SHITIJ "TIJ" VISHWAKARMA

MS. OCEAN ENGINEERING

BS. AEROSPACE ENGINEERING

FLORIDA TECH

TIJVISHWA.COM

GITHUB.COM/SHITIJ-V

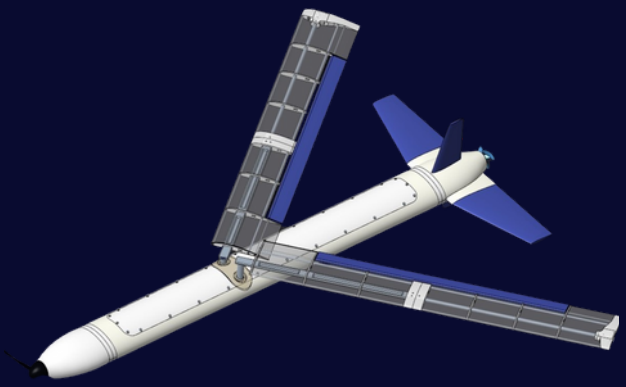
LINKEDIN.COM/IN/TIJV

(321) 503-2943

SVISHWAKARMA2015@MY.FIT.EDU

Nautilus Amphibious Vehicle

FLORIDA TECH · MATLAB · STAR-CCM+ · creo

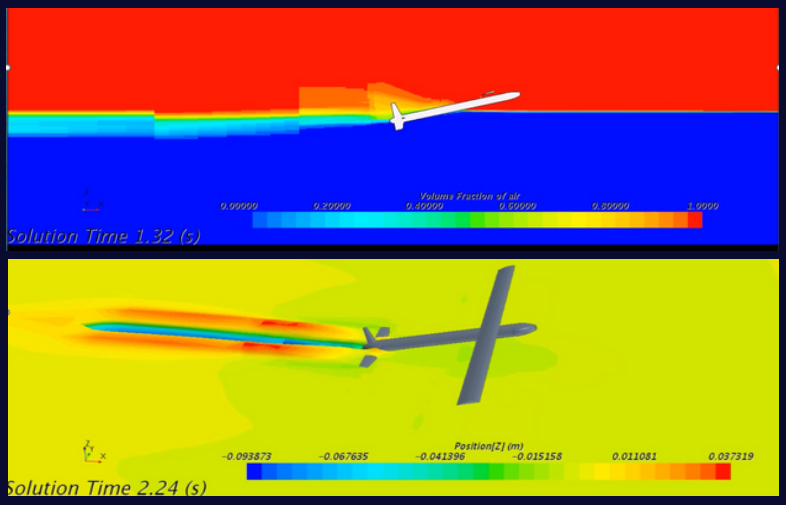


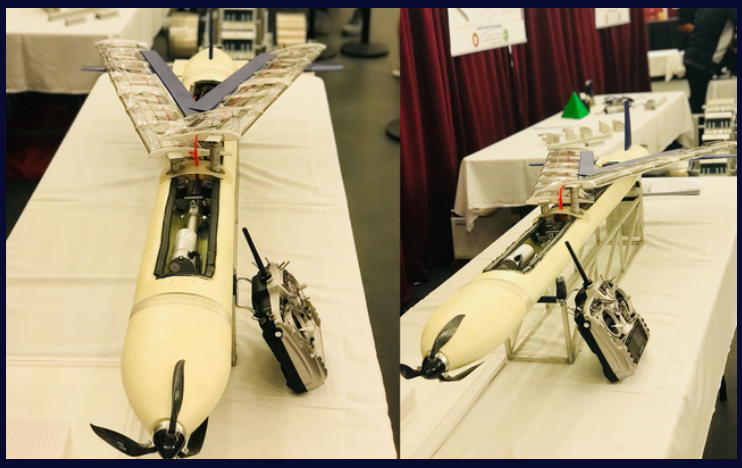
WHAT?

- CAPSTONE Senior Design Project and the predecessor to The Flying Fish
- Serve all purposes of an amphibious, fully-autonomous, reconnaissance UAV, AUV, and SSV.

HOW?

- Incorporating a linear actuator system on the wings to reduce hydrodynamic drag by folding them backward
- Dedicated marine propeller with rudders to maneuver underwater
- Dedicated, folding, carbon fiber front propeller to withstand 10K RPM but also reduce the drag underwater
- Fully-autonomous work cycle:
  UAV -> SSV -> AUV -> SSV -> UAV





RESULTS

- Successfully incorporated a folding wing mechanism using a linear actuator
- Successfully tested the static thrust to match the requirements
- Successfully tested the in-water buoyancy and maneuvering
- Successfully tested the autonomy cycle routine