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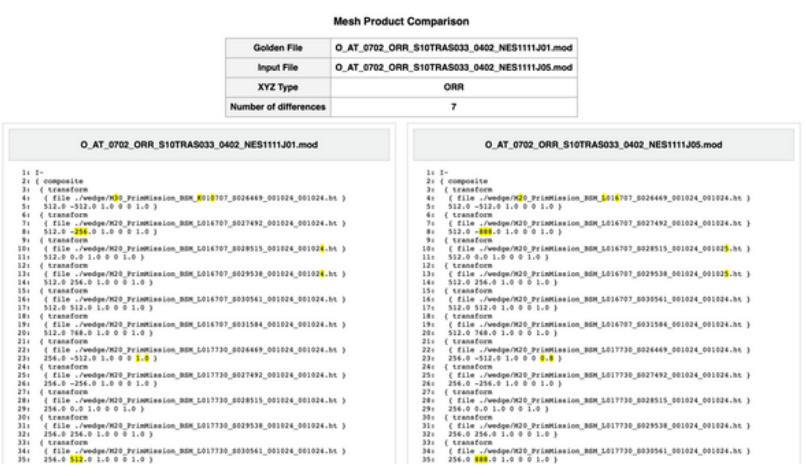
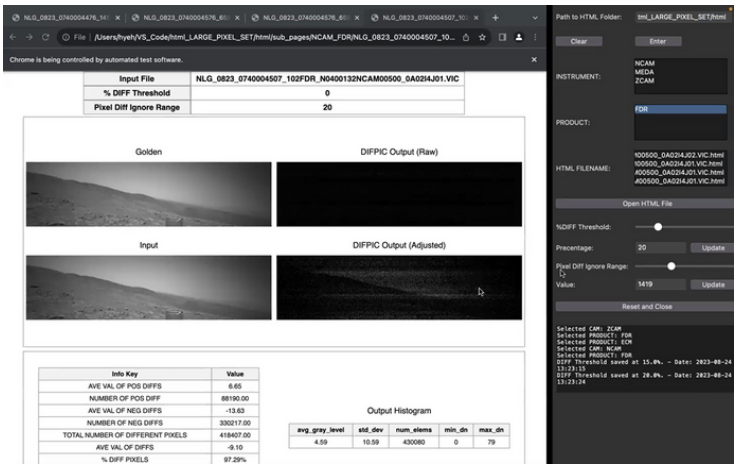
PERSEVERANCE ROVER CI/CD TEST SUITE - NASA JPL (LINK)





What?

- Implemented **Python test suites** to verify Mars rover data products
- CI/CD development with the **M20 database** at JPL

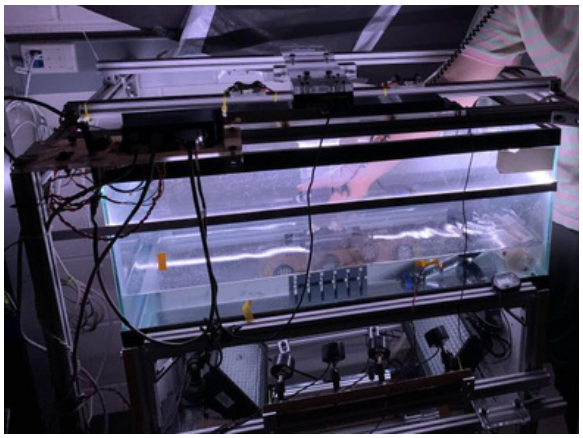
How?

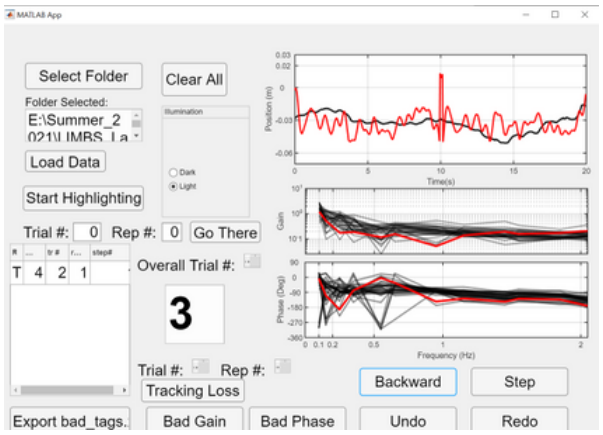
- Used the **Behave** framework **HTML** reports, **bash scripts,** and **S3 cloud**
- Worked with **GitHub** and **Linux remote machine**

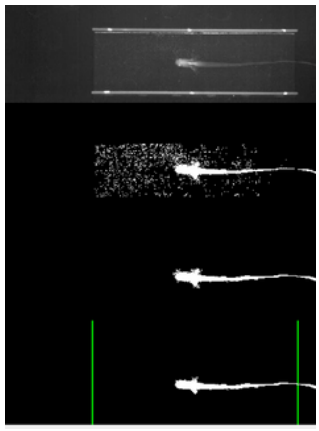
Results

- Supported validations of dozens of image/text data types on **DataDrive**
- Designed **data structures** to sort through thousands of images
- Built **Python GUI** for easy test parameter modification from users

ELECTRIC FISH LOCOMOTION RESEARCH - LIMBS LAB (LINK)







What?

- Designed and ran **800+ experiment trials** on object tracking behavior of electric fish
- Focusing on **control theory** in animal locomotion

How?

- Analyzed data with **MATLAB, Python**, and **DeepLabCut**
- Used **system ID** and **image processing**
- Rich experiences in **technical writing** and **presentations**

Results

- Presented **poster** at the 2023 SICB international conference
- Working on manuscript for a **first co-author journal article**

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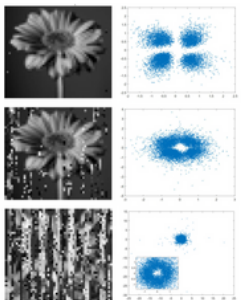
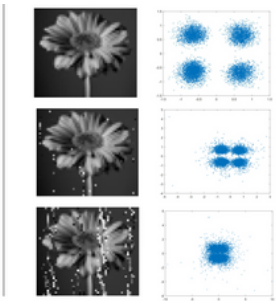
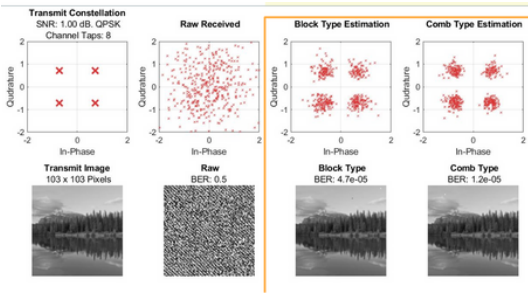
WIRELESS AUDIO + IMAGE TRANSMISSION - EPFL (LINK)







What?

- Use a speaker and microphone to **transmit images** wirelessly
- Implement **DSP algorithms** to recover noisy data

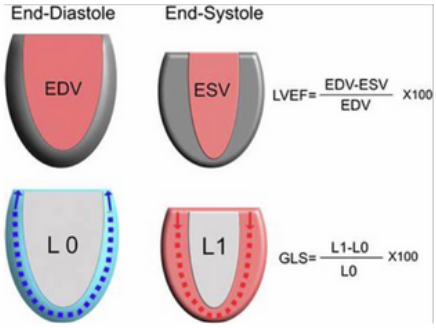
How?

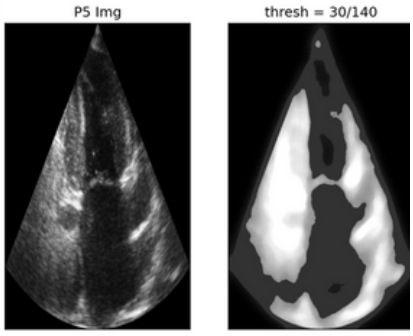
- Used **MATLAB** for data packaging, testing, and visualization
- Tested the system under different extents of audio fading

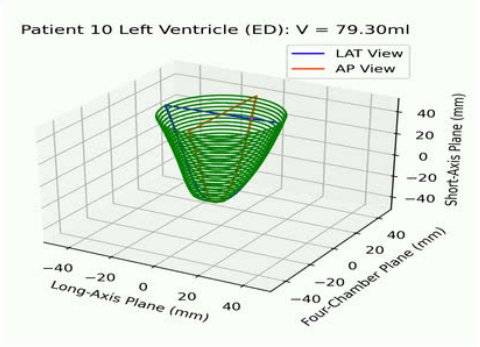
Results

- Achieved sub-0.00001 bit error rate with **OFDM algorithm**
- Comprehensively evaluated system performances with code

CARDIAC VOLUME 3D RECONSTRUCTION - JHU (LINK)







What?

- Used ultrasound images to re-construct **3D videos** of a beating heart
- Applied knowledge from the **Medical Image Analysis course**

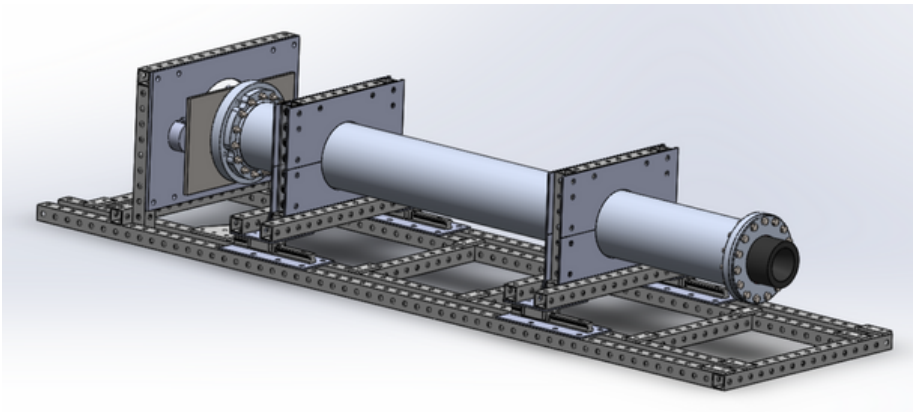
How?

- Used **Python, OpenCV,** and **MATLAB** for pre-processing, data pipeline design, and testing
- Constructed videos with interpolation

Results

- 64% accuracy with ESV and EDV volume estimations
- Robust LV identification with **image thresholding** and **template matching**

ROCKET THRUST STAND - ASTROJAYS ROCKETRY (LINK)



What?

- Used **SOLIDWORKS** and **ANSI technical drawings** to design a thrust stand for combustion chamber hotfire tests

How?

- Fulfilled design requirements to hold a O-class engine with **825 lb of thrust** and **9100lbf-s total impulse**
- Created the bill of materials and order list
- **Manufacturing completed** in fall 2022