

Since the retirement of the Shuttle program in 2011, NASA has been working on returning human space flight launches to the United States through the Commercial Crew Program (CCP). Currently, there are two commercial providers planning to perform uncrewed and crewed test flights at the end of this year to demonstrate their readiness to perform rotational flight missions to the International Space Station (ISS).

Commercial providers must be certified by NASA's Commercial Crew Program in order to perform regular flights to the ISS. Different aspects of the test launches are analyzed to ensure that the provider meets safety and mission requirements.



Introduction

As part of the CCP engineering team, specifically Ground Command and Control, I was tasked with implementing a tool that will facilitate the retrieval and analysis of post-flight data. This allows our team and other teams to effectively and efficiently analyze and evaluate post-flight data in order to certify commercial providers.

Post-Flight Data Analysis Tool

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Project/Analysis Tool

Currently, multiple solutions for data retrieval are available, but it is difficult for engineers to read and analyze the data in the existing format. Thus, priority has been given to the implementation of an analysis tool in Java. The tool provides a user interface (UI) with multiple features that allow engineers to easily read and analyze post-flight data.

Each feature was designed to serve a specific purpose and to read specific data types. For the purposes of this presentation, tool features have been modified to protect Sensitive but Unclassified (SBU) information.

Features

Data Log A Reads data logs in text format and allows the user to easily search and find keywords in the text.

Post Flight Data												
Mission Activity 1												
Look in:	📙 Mission Act 🗸 🤌 📂 🖽 -	Data Log A Data Log	B Data Log C									
	Data Set 1	Data Set 1.txt										
9	Data Set 1											
	Data Set 3	System 7	-0.045842367									
ent Items		System 2	0.306407388									
		System /	-0.3128/80/4									
		System 5	-0.352614384									
-luba a		System 1	0.35/6181/4									
esktop		System 2	0.241216695									
		System /	-0.069954621									
4		System 3	0.011608509									
ments		System /	-0.041521903	0.5211 0.07207221 2.052100250 0.088786021								
icina		System 1	-0.32861/11									
		System 7	-0.00281/248									
		System 7	0.0615964/1									
		System /	-0.040313239									
		System 1	0.5416/086									
		System /	0.04144203									
S		System /	-0.266459872									
k		System 3	-0.252/23946									
		System 6	-0.328407701	0.15000 0.50142635 0.41/69216/ -0.069491/09								
		System 6	-0.131408/64	0.13909 -0.33304330 -0.0903/1334 -0.40010009/								
		System 5	-0.229/29/84	0,41052 1,21000020 0,45002520 2,700057500								
		System 0	-0.002331466	0.75010 0.50055442 1.455725600 1.052557545								
		System 2	-0.21/2205/2	-0./0310 0.03033443 -1.430/23009 1.03233/343	•							
Search system 2 Match Case Cancel												
				(8 occurrences found)								

Data Log B

Reads data in CSV or Excel format and displays it in a table allowing the user to sort the table, filter data using keywords, group rows based on a specific criteria, and save filtered results into an Excel file.

			Mission/
			Post Fli
			Mission
Look in: 📙 Mission Act 🗸 🥠 📂 🛄 🗸	Data Log A Data Log B	Data Log C	
Data Set 1	Data Set 2.csv		
Data Set 2	System	Measurement 1	Measurement 2
Recent Items Data Set 3	System 5	-0.039679397	0.37963
	System 5	-0.1881292	0.0812
	System 5	-0.156181005	-0.5677
	System 5	-0.005829382	-0.20586
Dadutan	System 5	-0.138043274	0.23577
Desktop	System 5	0.052999861	-0.17811
	System 5	-0.352614384	0.55108
	System 5	-0.299144	0.26601
	System 5	0.08048004	0.58345
Documents	System 5	-0.032268532	-0.00679
	System 5	-0.223827142	0.783
	System 5	0.383408112	0.20821
	System 5	0.007309863	0.1841
This PC	System 5	0.647751822	0.15009
Network			

Org: NE-C6 Mentors: Tammy Kennedy and Daniel Victor Start Date: 1/29/2018 The University of Texas at Dallas Master's in Computer Science **Expected Graduation Date: Summer 2018**

Measurement 3	Measurement 4	Measurement 5		Reset
).47459566	0.161888064	-2.147024118	-1.	
). 1790 1952	-0.491338316	-2.56690957	Filter	
1.02192808	1.038459671	-0.654381062		
). 4931832	-0.599309042	0.614859277		
1.05975684	0.681202159	-1.140080914	Please select system	
0.01313106	-0.464738603	1.289337934		
).77550344	-1.252189947	1.135911019	System 1	
).28782114	-0.507905508	-1.215814016	System 5	
1.16627278	-0.674378817	0.809079128	System 3	
0.47086014	0.643358599	0.142871611	System 4	
).59535945	0.432078865	-1.844453018	System 6	
).21371126	1.477162285	-1.764486867	System 7	
1.22374314	1.050748084	-0.67329918	System 2	
0.16377461	-1.501940552	-0.712385464	Oystelli 2	

Save as an Excel File

Conclusion

The analysis tool is one of multiple phases of this project that will allow me to learn about the ways data is used and analyzed, work with different teams and be able to contribute to the work of the CCP in returning human space flight to the United States.

The next phase of this project is to test and configure alternative solutions for retrieving and analyzing data, and modifying these solutions to meet the needs of the Ground Command and Control team. This phase will also include implementation of plotting and graphing mechanisms using MATLAB and Winplot scripts.

With the completion of this project, Ground Systems Engineers will have a complete data retrieval and analysis suite that will be used to help them develop their Post-Flight Data Analysis packages.



References

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