Flight Software Workshop Agenda
Day 1 - Monday, October 21, 2024, 8:30 am - 4:00 pm

Type	Topic/Activity	Presenter	Time	Duration
Introduction		Jeff Levison	8:30	15
Presentation	01 Spacecraft Archtecture and System Overview	Michael Starch	8:45	15
Presentation	02 FSW System Engineering - Capability Layers	Michael Starch	9:00	60
	Drivers			
	Services			
	Applications			
Break			10:00	15
Presentation	03 FSW Architecture, Requirements & Design	Garth Watney	10:15	60
	Software architecture			
	Software requirements			
	Structural analysis			
	Data flow diagrams			
	Software design			
	State machine models			
Presentation	04 F' Introduction	Michael Starch	11:15	45
Lunch			12:00	60
	05 FPP Introduction	Rob Bocchino	1:00	15
Exercise	Lab project introduction	Michael Starch	1:15	15
	Lab project setup	Michael Starch	1:30	15
	System requirements definition	Michael Starch	1:45	30
Break			2:15	15
Presentation	06 FSW Design	Michael Starch	2:30	90
	FSW system modeling in F' (Types, ports, components, topology definitions)			
	Data types, interfaces			
	Commands, telemetry events, parameters and data products			
	Concurrency, initialization, memory allocation			
	OS abstraction layer (message queues, mutex, tasks, file system)			
	Interface design patterns			
	Serializing and deserializing data			
	Designing and visualizing topologies			

Day 2 - Tuesday, October 22, 2024, 8:30 am - 3:30 pm				
Type	**Topic/Activity**	**Presenter**	**Time**	**Duration**
Exercise	Component Design and Initial Implementation	T. Boyer-Chammard	8:30	60
	Implementing commands and events			
	Initial Component Integration	T. Boyer-Chammard	9:30	30
	F´ Deployment and introduction to the GDS			
	Establishing the initial topology			
Break			10:00	15
	07 Reducing Risk	Rob Bocchino	10:15	45
	Defensive coding			
	Avoiding C and C++ pitfalls			
	Static and dynamic analysis			
	08 Suggestions for Coding Style	Rob Bocchino	11:00	45
	Modules and components			
	Functions			
	Expressions and statements			
	09 Basic Data Structures	Rob Bocchino	11:45	30
	Implementation			
	When to choose which one			
Lunch			12:15	60
Exercise	Full Component Implementation	Kevin Ortega	1:15	60
	Implementing telemetry, parameters and port calls			
	System Integration	Kevin Ortega	2:15	30
	Completing the topology			
	Running on Hardware	Kevin Ortega	2:45	45
Lab Tour (optional)			3:30	60

Day 3 - Wednesday, October 23, 2024, 8:30 am - 4:00 pm				
Type	**Topic/Activity**	**Presenter**	**Time**	**Duration**
Presentation	10 Unit Testing	Rob Bocchino	8:30	30
	Basic principles of testing			
	Writing modular tests			
	Achieving and checking code coverage			
	Picking good inputs			
	11 F' Unit Test Framework	Rob Bocchino	9:00	30
Exercise	Writing unit tests	Rob Bocchino	9:30	60
Break			10:30	15
Presentation	12 Systems Testing	Michael Starch	10:45	45
	F' GDS overview			
	Test API			
Lunch			11:30	60
Exercise	System testing with the GDS	Celeste Smith	12:30	80
Presentation	13 FSW Development Process	Aadil Rizvi	1:50	60
	FSW level process - waterfall model, artifacts, reviews			
	Component level process - checklists, reviews			
	FSW planning and reporting			
Presentations	Lightning Talks	Various	2:50	75
Closing		Jeff Levison	4:05	

Day 3 - Wednesday, October 23, 2024, Lightning Talks			
Affiliation	**Title**	**Presenter**	**Time**
University of Utah	CubeSat Initiatives at the University of Utah	Alex Gilsoul	2:50
Space Telecommunications, Inc	Connecting the Unconnected: A Global Autonomous 5G-NTN Constellation Transacting on a Blockchain for the Emerging World	Scott Hasbrouck	2:55
Cal Poly Pomona	CubeSat Technology Exploration Project - CubeSTEP	Eduardo Becerra	3:00
Utah State University	F' for Undergraduates: Integrating F' into the GASRATS CubeSat	Joshua Hessing and Devin Schutz	3:05
Northeastern University	Conquering the Terahertz Band in Space: Enabling Next-Generation Space-ground Networks through Sub-THz Small-Satellite Communication	Sergi Aliaga	3:10
Cal Poly Pomona	SMART-FLY: Strategic Monitoring and Real-time Targeting using FPGA, YOLO, and NLP for Future UAVs	Mohamed Aly	3:15
Utah State University	ROS 2 for remote sensing and beyond: the Scientific Timely Actionable Robotic Data Operating System (STARDOS)	Sadikul Alim Toki	3:20
KU Leuven	CubeSpec: High-resolution spectroscopy for asteroseismology on a 12U CubeSat	Sibo Van Gool	3:25
Bronco Space | Cal Poly Pomona	The Pleiades CubeSAT Cluster	Matthew Chang	3:30
nou Systems, Inc.	SEE-ER: Observation and Autonomous Tracking of Co-Passenger Object Deployments	David Carpman	3:35
Columbia University	LIONESS: Line Imaging Orbiter for Nanosatellite-Enabled Spectrographic Surveys	Moises Mata and Wesley Maa	3:40
Starfish Space	From Code to Cosmos: The Role of Software in Satellite Servicing	Rachel Rise	3:45
UC Santa Cruz	SlugSat's Journey to Flight	David Uniack	3:50
Aclectic Systems Inc	Project Ephemeris & Polymath: A Space Rescue Mission as Forcing Function for a new Visual Supercomputing Platform for Visual Simulation of Digital Twins	Yahya Mizra	3:55
Cal State Long Beach	CubeSat Mission: SharkSat-1	Aaryan Gupta	4:00