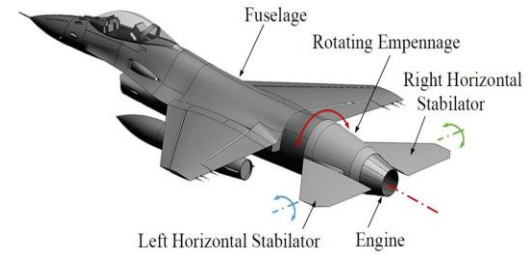


Lunch 'n' Learn
16 October 2026

Mission Engineering for a Bio-Inspired Rotating Empennage Digital Concept

Guest Speaker: Mr. David Blubaugh, AFRL



Abstract: Modern aerospace systems increasingly require engineering approaches that connect emerging vehicle technologies to mission-level objectives, operational environments, system interactions, and measurable mission outcomes. This presentation discusses the application of mission engineering and digital engineering concepts to a Bio-Inspired Rotating Empennage (BIRE) aircraft concept investigated during a summer research effort with the Air Force Research Laboratory. The presentation will introduce the BIRE concept and examine how mission-engineering methods can be used to place an emerging aircraft technology within a broader mission context rather than evaluating it solely as an isolated subsystem. Particular attention will be given to the use of model-based systems engineering and SysML v2 concepts to represent mission needs, operational interactions, system architecture, requirements, and engineering traceability. The presentation will also discuss how these digital models can provide a foundation for connecting mission analysis, aircraft and flight-control engineering, simulation, telemetry, verification, and future digital-engineering activities (agentic knowledge graphs). The objective is to illustrate how a mission-centered digital engineering framework can help engineers reason systematically from mission needs to system-level engineering decisions while maintaining traceability across the engineering lifecycle.

Biography: David Blubaugh is an electrical engineer and Ph.D. researcher whose interests include mission engineering, model-based systems engineering, digital engineering, embedded systems, autonomous systems, flight-control systems, formal verification, and aerospace systems engineering. He earned his B.S. and M.S. degrees in Electrical Engineering from Wright State University and has pursued doctoral research in Electrical and Systems Engineering at the University of Dayton. During the summer of 2026, he participated in a SOCHE summer research internship with the Air Force Research Laboratory, where his work examined mission-engineering and digital-engineering approaches for a Bio-Inspired Rotating Empennage aircraft concept. His broader technical experience includes embedded C/C++, Python, MATLAB/Simulink, FPGA development, programmable logic controllers, robotics, SysML, and formal verification methods. His research interests center on connecting mission engineering, system architecture, modeling and simulation, flight controls, verification, and digital engineering into traceable engineering workflows for complex aerospace and autonomous systems.

Time: 11:45 am

Location:

China Garden Buffet
112 Woodman Dr.
Dayton, OH 45431

Lunch:

You will be able to
purchase the buffet

