

# Group 2

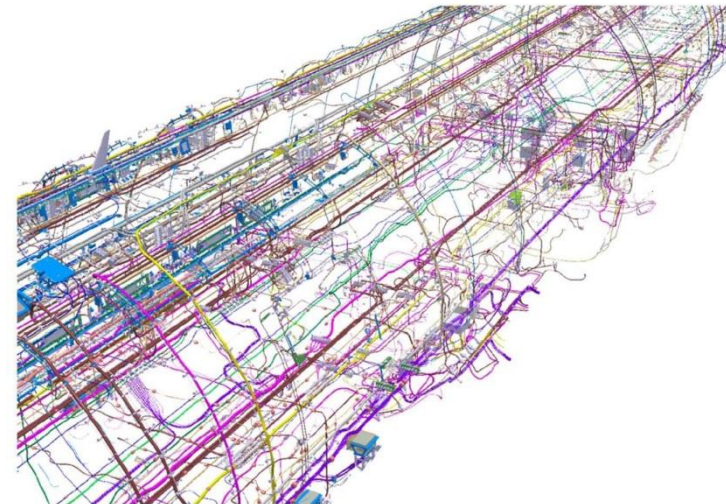
2.5 Reliable Wireless Communications in Aircraft and Other Challenging Environments, PI: X. Zhou, SIUC

## Reliable Wireless Communications in Aircraft and Other Challenging Environments

Xiangwei Zhou (PI) and Feixiang Zhang (Student)  
Department of Electrical and Computer Engineering  
Southern Illinois University Carbondale

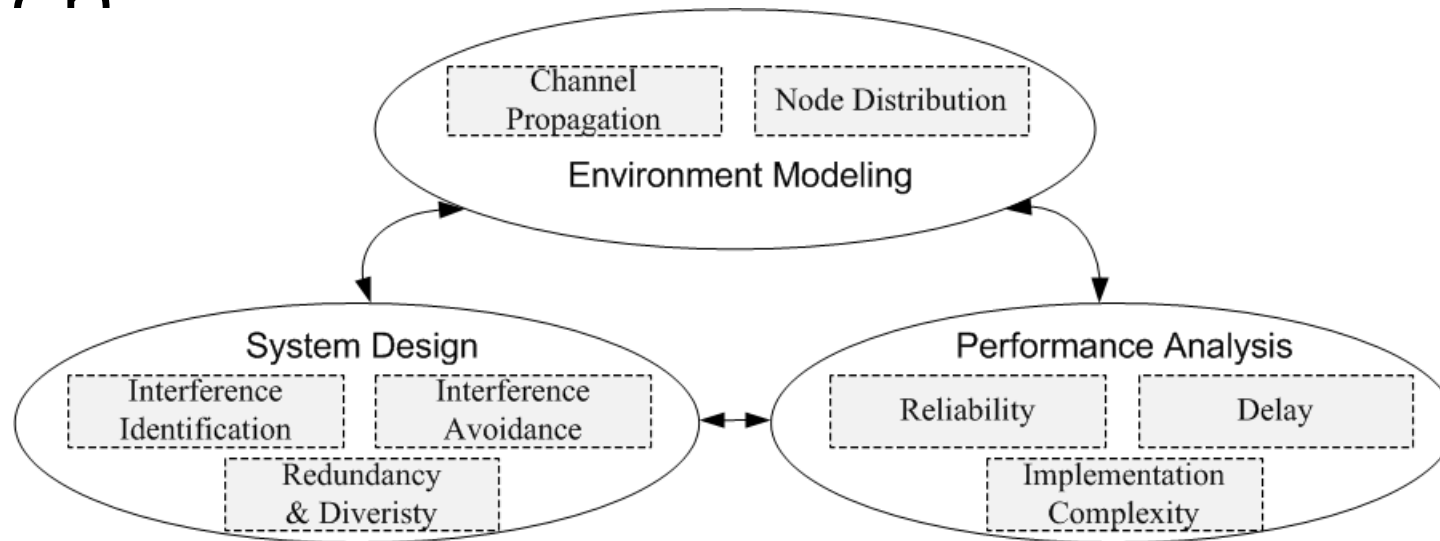
# Project Overview and Description

- Problem
  - Conventional wired connections
    - issues in weight, cost, safety, maintainability
  - Current wireless connections
    - not reliable enough
- Potential applications
  - Aircraft
    - safety-critical
    - diagnostic
  - Hazard detection
    - fire, gas leaks
    - structural weakness



Electrical systems in A350.

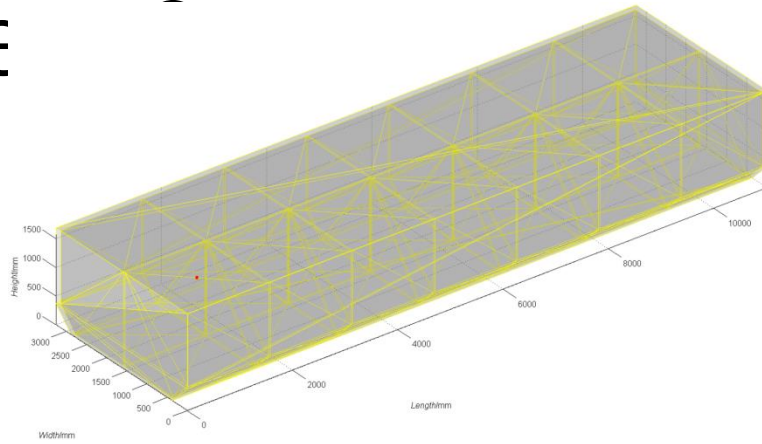
# Approach



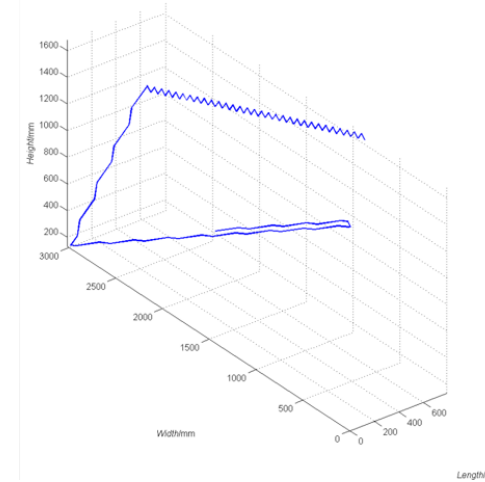
- **Potential benefits**

- Development and integration of reliable wireless systems
- Feasibility validation of wireless solutions and products

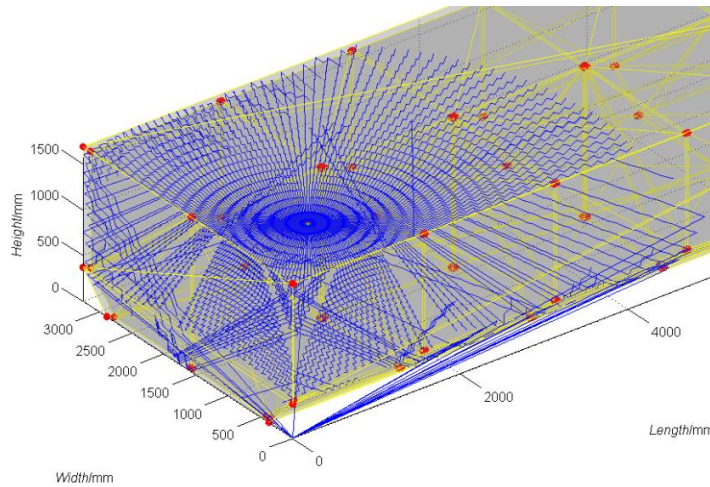
# Proje



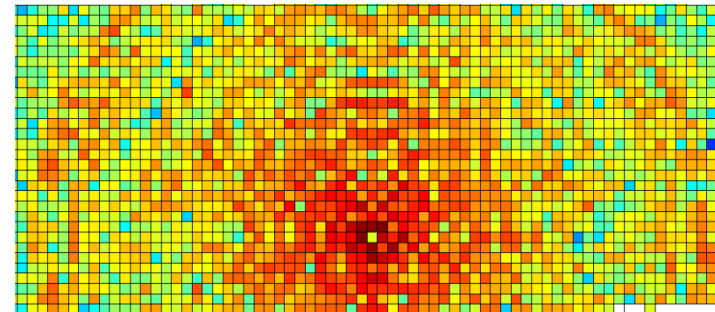
Built 3D environment structure.



Simulated multi-reflection in the structure.



Built raytube database by applying ray tracing theory.



Obtained energy distribution results for typical scenarios.

# Proj

	Description	Date	Status
1	Environment modeling - development	08/15/2013-08/31/2014	Mostly Done
2	Environment modeling - simulation	10/01/2013-08/31/2014	Mostly Done
3	System design - development	08/15/2014-02/14/2015	
4	System design - simulation	10/01/2014-03/31/2015	
5	Performance analysis - mathematical	02/15/2015-06/30/2015	
6	Performance analysis - experimental	04/01/2015-08/31/2015	

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## Deliverables—

midterm report & presentation  
simulation programs  
final report & presentation

# Executive Summary

- Novelty

- Tailored to specific operational environments
- Robustness against interference and failure
- Flexible balance between reliability and cost

