Center for Embedded Systems

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Reliable Wireless Communications in Aircraft and Other Challenging Environments

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Project Overview and Description

- **Project Description**
  - Reducing the complexity of electrical wiring
  - Improving the operational efficiency

- **Problem**
  - Propagation model for cabin environment
  - Assurance of high reliability

Approach

- Signal mapping considering distinct characteristics of cabin environment
- Using beamforming technology to improve efficiency and reliability
- Providing guideline and strategy for deployment of nodes in cabin environment

Project Status

Date	Description
Sept. 16	Introduction to Beamforming
Sept. 25	Smart Antenna based on Beamforming
Oct. 2	Adaptive Beamforming Algorithm
Oct. 9	Path Loss in Aircraft Environment
Oct. 23	Radio Propagation in Aircraft Environment – Path Loss
Oct. 30	Radio Propagation in Aircraft Environment – Shadowing/Fading
Nov. 13	Beamforming Simulation
Nov. 20	Indoor Signal Propagation Simulation
Dec. 2	2-D Cabin Simulation

Project Tasks/ Deliverables

	Description	Date	Status
1	Choose beamforming technology to improve efficiency and reliability	Oct. 2	Done
2	Set up wireless signal propagation model for cabin environment	Oct. 30	Done
3	Beamforming simulation with variable antennas and incoming signal directions	Nov. 13	Done
4	2-D aircraft cabin environment simulation using multi-wall method	Nov. 20	Done
5	Path loss simulation in seat, arm & back, and top levels in cabin area with different number of APs	Dec. 2	Done
6	Beamforming simulation combined with signal propagation in cabin environment		To be cont.

Executive Summary

- **Theoretical preparation**
  - Propagation model
  - Beamforming application
- **Simulation work**
  - Beamforming simulation
  - 2-D cabin environment
  - Path loss simulation in cabin area