Master's Thesis Defense Announcement
Mechanical and Aerospace Engineering Department
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ENERGY ANALYSIS OF REAR DOOR HEAT EXCHANGERS
IN EDGE AND COLOCATION DATA CENTERS WITH
DYNAMIC WORKLOAD DISTRIBUTION

By

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Abstract

In recent years, applications including IoT (Internet of Things), content delivery, and 5G have created a large demand for low-latency access to data processing and data storage. Traditional centralized data centers weren't designed with those use cases in mind. Small data centers such as edge computing data centers and colocation data centers house more than half of all servers across the United States. Rear Door Heat exchangers (RDHx) provide an energy-efficient cooling solution to traditional CRAC/CRAH - based cooling methods by localizing the heat removal from the rack. With more control over air distribution through a shorter path between the hot air and the heat removal, this cooling method is efficient and predictable and can easily be implemented into existing data centers. In this study, RDHx implemented in a Edge computing center and Colocation Data center models using commercially available CFD software (6SigmaRoom). TCO (Total Cost of Ownership) and Cooling costs of the data center models are calculated and compared to traditional air cooling