

PhD. Dissertation Defend Examination

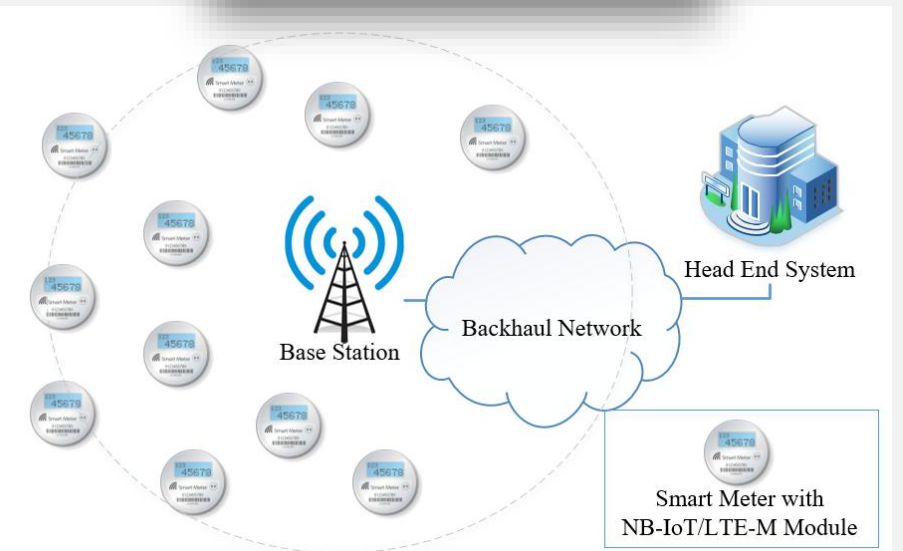
Presented by

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Advisor: Assoc. Prof. Dr. Chaiyod Pirak



Dissertation Title: An Adaptive Algorithm for Cellular IoT Network Selection for Smart Grid Last Mile Communications



Highlight Summary

The selection of an appropriate communication technology should therefore be based on the specific requirements of the CloT application, as well as the signal-strength characteristics of the deployment environment. For smart grid last-mile communications, where network reliability is paramount, this decision-making process is crucial for ensuring system efficiency and resilience. In smart grids, last-mile communication plays a critical role in delivering real-time data from distributed smart meters and sensors to a central grid management system; therefore, selecting the appropriate technology is essential. Smart grid communication networks require both reliability and energy efficiency, particularly in rural or otherwise challenging environments with limited infrastructure.

This dissertation proposes an adaptive approach for selecting between NB-IoT and LTE-M based on communication requirements and environmental conditions in smart grid last-mile systems. By analyzing key parameters such as RSRP, the proposed framework ensures that the most suitable technology is selected for each deployment scenario, thereby enhancing the performance and scalability of smart grid communications. To further improve the intelligence and adaptability of the proposed CloT selection framework, this study incorporates supervised machine learning algorithms to automate the technology selection process using empirical field measurement data. Specifically, three classification models—Decision Tree (DT), Support Vector Machine (SVM), and Extreme Gradient Boosting (XGBoost)—are employed to learn the relationship between signal-strength characteristics, spatial deployment information, and the optimal CloT technology selection outcome.

Date: May 12, 2026

Time: 9.30 A.M.

Venue: TGGS 4th Floor
 Room 406

Registration is open from today until 8 May 2026

QR Code for
 Registration

