

Title:

Investigating GSM Network Improvements for Enhanced Communication: A Study in Oaxaca, Mexico

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Abstract:

The Global System for Mobile Communications (GSM) is an intrinsic part of daily telecommunication, serving as a critical conduit for global mobile connectivity. While the 2G GSM network, initiated in 1991, is often viewed as antiquated, it provides a crucial communication lifeline in regions where 4G or 5G networks can't be effectively deployed.

In the context of Oaxaca, Mexico, an alarming number of communities are devoid of mobile communication access. To tackle this, the non-profit organization Telecomunicaciones Indigenas Comunitarias (TIC-AC) is harnessing open-source technology from Rhizomatica. The continued organization and collaboration within these communities is vital.

This research aspires to enhance Rhizomatica's existing routing infrastructure, aspiring to engineer a system that is not only more efficient and cost-effective but also easier to maintain, with potential scalability to 4G or 5G technology. The research is unfolded across four progressive phases:

Phase 1: The current phase centers around locally reconstructing Oaxaca's network infrastructure to thoroughly comprehend its implementation.

Phase 2: This phase is concerned with code refactoring to simplify system maintenance.

Phase 3: Here, the focus lies on augmenting the current signal-processing algorithm.

Phase 4: The concluding phase delves into exploring the prospects of software-based signal processing algorithms for implementing 4G/5G technology.