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ENHANCING QUALITY RESEARCH &

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DEVELOPMENT



P-336 Climatic Data Acquisition System for Satellite Communications

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Several climatic dynamic phenomena such as rain and turbulence can seriously affect the quality of satellite communications. This project presents the design and implementation of a data acquisition system. The system provides accurate vital information to facilitate proper analysis of anticipated problems so that solutions can be incorporated when designing earth-satellite systems.

Signals from the beacon of MEASAT3 located at 91.5°E orbit is received by a 2.4 meter Parabolic dish. The signal is measured in real-time by a Spectrum Analyzer using a General Purpose Interface Bus (GPIB) cable which provides high speed transmission. The system is equipped with a synchronized 0.2mm tipping bucket rain gauge. For data logging and analysis a system was developed using LabView version 8.6. The logging process involves data recording every 0.1 second.

P-338 Development of an Arabic Text-to-Speech System

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Research on Text-to-speech technology has received the interest of professional researchers in many languages which is a consequence of wide range of applications where Text-To-Speech is implemented. However, Arabic language, spoken by millions of people as an official language in 24 different countries, gained less attention compared with other languages despite the fact that it has a religious value for more than 1.6 billion Muslim worldwide. These facts exhibit the need for a high quality, small size, and completely free Arabic TTS with the ability of future improvements. The vowelized written text of Arabic language carries the pronunciation rules with limited exceptions, so rule-based system with an exception dictionary for words that fail with those letter-to-phoneme rules may be a much more reasonable approach. This project propose a rule-based text- to- speech synthesis system for Standard Arabic, named SARA-TTS based on open-source software with acceptable naturalness. The simulation results of the proposed system shows good quality in handling word, phrase, and sentence level. Further improvements need to be done for stressed syllable position and intonation.

P-341 A Secure Key Distribution Protocol Based on Hash Functions and a Quantum-authenticated Channel Using 6DP (KDP-6DP)

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Security is the most tedious problem in highly sensitive communications. Quantum security is the key issue in solving the problem. A key distribution protocol based on the use of hash functions is proposed. The essential part of the protocol depends on sending a string of random characters from sender to receiver. Then, a selected hash or a cascade of two hash functions and a long-term shared secret are used to construct the key. Consequently, the session key is generated on-site by independently applying a hash function on the random string at the sender and receiver sides. This protocol requires a reliable method of authentication. Therefore, it is further proposed to use an out-of-band authentication methodology based on the deterministic six-state quantum authentication protocol that is referred to as 6DP.