SBL-Based Joint Sparse Channel Estimation and Maximum Likelihood Symbol Detection in OSTBC MIMO OFDM Systems

ABSTRACT

- This work presents sparse Bayesian learning based schemes for approximately sparse channel estimation in an orthogonal space-time block coded multiple-input multiple-output orthogonal frequency division multiplexing wireless system.
- The parameterized prior-based SBL framework is employed to present a pilot scheme for an ill-posed OSTBC MIMO-OFDM channel estimation scenario.
- Maximum likelihood symbol detection has been incorporated in the expectation maximization framework for SBL-based channel estimation.

EXISTING SYSTEM

- Furthermore, orthogonal frequency division multiplexing has become an attractive choice for MIMO systems owing to its resilience to multipath fading.
- However, their performance gains are severely affected by the accuracy of channel estimates at the receiver and thus draws significant research attention for channel estimation in OSTBC MIMO-OFDM systems.

PROPOSED SYSTEM

- This has led to the development of a novel scheme for joint approximately sparse channel estimation and symbol detection.
- The proposed scheme performs SBL-based channel estimation in the E-step followed by a modified ML decision metric-based symbol detection in the M-step.
- Bayesian Cramér Rao bounds are obtained for the genie minimum mean squared error estimators corresponding to the SBL schemes.
- Closed form bit error probability expressions are derived for MLSD in the presence of SBL-based channel estimation errors.

HARDWARE REQUIREMENTS

- Processor - Intel core i3
- RAM - 2B
- Hard Disk - 20 GB

SOFTWARE REQUIREMENTS

- Operating System : LINUX
- Tool : Network Simulator-2
- Front End : OTCL (Object Oriented Tool Command Language)

REFERENCE

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