

# ADAPTIVE DETECTION FOR CDMA MULTIPATH SIGNAL BASED ON SIGNATURE WAVEFORM TRACKING

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## ABSTRACT

THIS THESIS AIMS TO PROVIDE A ROBUST MULTIUSER DETECTION STRUCTURE THAT ADAPTIVELY TRACK -S DISTORTION SIGNATURE WAVEFORM FOR CDMA (CODE DIVISION MULTIPLE ACCESS) MULTIPATH SIGNAL -S.WE FIRST SYSTEMATICALLY SURVEY VARIOUS LINEAR MULTIUSER DETECTORS (LMDS) AND EXPLORE TH -EIR CONNECTIONS IN THE AWGN (ADDITIVE WHITE GAUSSIAN NOISE) CHANNEL.IN PRACTICAL WIRELESS ENVIRONMENT,MULTIPATH FADING LEADS TO SIGNATURE WAVEFORM DISTORTION THAT SEVERELY DEGRADES THE PERFORMANCE OF THE LMDS DESIGNED BY EXPLOITING THE ORIGINAL SIGNATURE WAVEFORM.THE IMP -ACT OF SIGNATURE WAVEFORM PERTURBATION ON THE PERFORMANCE OF THE LMDS IS EXTENSIVELY ANAL -YZED IN THIS PAPER.IN WHAT FOLLOWS,AN ITERATIVE ALGORITHM IS PROPOSED TO TRACK THE SIGNAT -URE WAVEFORM PERTURBATION SUCH THAT THE DETECTOR CAN BE DESIGNED BY EXPLOITING THE ESTIMA -TED EFFECTIVE SIGNATURE WAVEFORM.THE RATIONALE OF ADAPTIVE PROCESSING IS BASED ON THE SUB -SPACE METHOD AND THE MINIMUM VARIANCE DISTORTIONLESS RESPONSE(MVDR)BEAMFORMING TECHNIQUE. PERFORMANCE EVALUATION REVEALS THAT UNDER MULTIPATH FADING ENVIRONMENT,THE PROPOSED ADAPT -IVE MULTIUSER DETECTION STRUCTURE REDUCES THE IMPACT OF SIGNATURE WAVEFORM PERTURBATION ON THE PERFORMANCE OF THE LMDS TO A GREAT EXTENT.

Keywords : SIGNATURE WAVEFORM , SUBSPACE METHOD , MINIMUM VARIANCE DISTORTIONLESS RESPONSE (MVDR) BEAMFORMING

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