衰減通道中進階預測器DPCM影像傳輸系統

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摘 要

本研究利用四分樹影像分割法(QUADTREE SEGMENTATION)改善數位影像模式中的非穩定(NON-STATIONA -RY) 統計狀態，並使用雙預測器誤差脈波編碼調變(DOUBLE PREDICTOR DIFFERENTIAL PLUSE CODEMODUL -ATION, DP-DPCM)方式，藉以改善傳統DPCM的量化誤差及增加影像壓縮率和傳輸速度。我們使用四相位 鍵移(QUADRATUREPHASE SHIFT KEYING, QPSK)調變及加上通道雜訊，來模擬近似現今無線通訊(WIRELES -S COMMUNICATION)的系統。通道編碼的部分，我們採用迴旋編碼器，解碼器則使用最大相關威特比硬 性決定解碼，使用通道編碼來保護我們的資料在通過衰減通道時能減少錯誤位元發生。我們將探討以此 進階雙預測器DPCM影像傳輸在衰減通道的效能。

關鍵詞 : 四分樹影像分割法、統計非穩定狀態、雙預測器誤差、脈波編碼調變、四相位鍵移、 通道雜訊、衰減通道。

目錄

參考文獻

[1] J. C. WU AND D. G. DAUT "ADAPTIVE NONSTATIONARY DPCM IMAGE CODING WITH VARIABLE BLOCKS IZE" PROCEEDINGS OF THE 1997 SPIE SYMPOSIUM ON VISUAL COMMUNICATIONS AND IMAGE PROCESSING ,3024 , 447-458 [2] 陳鴻斌"ADVANCED DOUBLE PREDICTOR DIFFERENTIAL PULSE CODE MODULATION IMAGE TRANSMISSION SYSTEM" 私立大葉大學碩士論文，JUNE，1999 [3] J. VAISEY, AND A. GERSHO, "IMAGE COMPRESSION WITH VARIABLE BLOCK SIZE SEGMENTATION" IEEE TRANS. ON SIGNAL PROCESSING VOL. 40 AUG. 1992 [4] SIMON HAYKIN "COMMUNICATION SYSTEM" 3RD ED.WILEY 1994 [5] A. BRUCE CARLSON "COMMUNICATION SYSTEMS" 3RD ED MCGRAW-HILL [6] D. G. DAUT , D. ZHAO , AND J. C. WU "DOUBLE PREDICTOR DIFFERENTIAL PULSE CODE MODULATI -ON ALGORITHM FOR IMAGE DATA COMPRESSION" OPTICAL ENGINEERING , VOL 32 NO 7 , JULY 1993.
[7] N. S. JAYANT AND P. NOLL "DIGITAL CODING OF WAVEFORMS"PRENTICE-HALL , ENGLEWOOD CLIFFS ,NJ 1984 [8] DAVID G. DAUT AND JAMES W. MODESTINO "TWO-DIMENSIONAL DPCM IMAGE TRANSMISSION OVER FAD -ING CHANNEL" IEEE TRANS. COMMUN. VOL.COM-31 NO.3 MARCH 1983 [9] STEPHEN G. WILSON "DIGITAL MODULATION AND CODING" PRENTICE-HALL, N.J. 1996 [10] JOHN G. PROAKIS "DIGITAL COMMUNICATIONS" 4RD ED. MCGRAW-HILL 2001 [11] MARTIN BOSSERT "CHANNEL CODING FOR TELECOMMUNICATIONS"NY. WILEY 1999 [12] MICHELSON,ARNOLD M. AND LEVESQUE, ALLEN H."ERROR-CONTROL TECHNIQUES FOR DIGITAL COMMU -NICATION" JOHN WILEY 1985 [13] GEORGE C. CLARK, JR., AND J. BIBB CAIN "ERROR-CORRECTION CODING FOR DIGITAL COMMUNICA -TIONS" PLENUM PRESS, NY. 1981 [14] JOHN G. PROAKIS AND MASOUD SALEHI "COMMUNICATION SYSTEMS ENGINEERING"

PRETNICE-HALL 1994 [15] THEODORE S. RAPPAPORT "WIRELESS COMMUNICATIONS" PRENTICE HALL 1996 [16] J. D. PARSONS "THE MOBILE RADIO PROPAGATION CHANNEL" NY. WILEY 1996 [17] ROY D.YATES AND DAVID J.GOODMAN "PROBABILITY AND STOCHASTIC PROCESSES" JOHN WILEY 1999 [18] FADY I. ALAJAJI, SAUD A. AL-SEMARI, AND PHILIPPE "VISUAL COMMUNICATION VIA TRELLIS CODING AND TRANSMISSION ENERGY ALLOCATION" IEEE TRANS. COMMUN. VOL 47 PP 1722-1728 NOV.1999.
[19] D. G. DAUT AND J.-C. WU "ADAPTIVE COSINE TRANSFORM IMAGE CODING WITH VARIABLE BLOCK SIZE AND CONSTANT BLOCK DISTORTION" IN THE 1996 SYMPOSIUM ON VISUAL COMMUNICATIONS AND IMAGE PROCESSING, SPIE VOL. 2727, PP. 1104-1115, MARCH.1996.
[20] YEON KYOON JEONG AND KWANG BOK LEE "PERFORMANCE ANALYSIS OF WIDE-BAND M-ARY FSK SYS -TEMS IN RAYLEIGH FADING CHANNELS" IEEE TRANS. COMMUN., VOL. 48. PP. 1983-1986.DEC. 2000.
[21] MARCO LOPS, GIUSEPPE RICCI, AND ANTONIA MARIA TULINO "NARROW-BAND-INTERFERENCE SUPPRE SSION IN MULTIUSER CDMA SYSTEMS" IEEE TRANS. COMMUN., VOL. 46 PP. 1163-1175 SEP.1998 [22] JIA-CHYI WU AND WEI MA "PERFORMANCE-CONTROLLED INTEGRATED DIGITAL WIRELESS COMMUNICA -TIONS SYSTEMS" PROCEEDING OF THE FIFTH SYMPOSIUM ON COMPUTER AND COMMUNICATION TECHN -OLOGY,PP. 4D32-4D37 OCT. 2000 [23] KAZUO MORI AND TAKEHIKO KOBAYASHI "LOAD-BASED TRANSMISSION CONTROL FOR CDMA CELLULAR PACKET SYSTEMS WITH RAYLEIGH FADING CHANNELS" IEICE TRANS. FUNDA. VOL.E82-A PP.1151 -1160 JULY 1999 [24] YORAM BRESLER, VELLENKI UMAPATHI REDDY, AND THOMAS KAILATH "OPTIMUM BEAMFORMING FOR COHERENT SIGNAL AND INTERFERENCES"IEEE TRANS. ACOUSTICS, SPEECH AND SIGNAL PROCESSING VOL. 36 PP.833-842 JUNE 1988.
[25] ROBER LINK, AND SAMIR KALLEL "OPTIMAL USE OF MARKOV MODELS FOR DPCM PICTURE TRANSMISS -ION OVER NOISY CHANNELS"IEEE TRANS. COMMUN. VOL. 48 PP. 1720-1711 OCT. 2000 [26] ODILE MACCHI, AND CHRISTINE UHL "STABILITY OF THE DPCM TRANSMISSION SYSTEM" IEEE TRAN -S. CIRCUITS AND SYSTEMS VOL.39 PP. 705-722 OCT. 1992.
[27] SEYMOUR STEIN "FADING CHANNEL ISSUES IN SYSTEM ENGINEERING"IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS VOL.SAC-5 PP. 68-89 FEB. 1987 [28] EZIO BIGLIERI, JOHN PROAKIS, AND SHLOMO SHAMAI "FADING CHANNELS:INFORMATION-THEORETIC AND COMMUNICATIONS ASPECTS"IEEE TRANS. INFORMATION THEORY. VOL. 44 PP. 2619-2692 OCT. 1998 [29] Y. K. SOME, AND P. Y. KAM "BIT-ERROR PROBABILITY OF QPSK WITH NOISY PHASE REFERENCE" IEE PROC.-COMMUN., VOL. 142 PP.292-296 OCT. 1995 [30] JUSTIN C.-I CHUANG "COMPARISON OF COHERENT AND DIFFERENTIAL DETECTION OF BPSK AND QPS -K IN A QUASISTATIC FADING CHANNEL"IEEE TRANS. COMMUN. VOL. 38 PP. 565-567 MAY 1990 [31] NORMAN C. BEAULIEU, ANDREW S. TOMS, AND DAVID R. PAULUZZI "COMPARISON OF FOUR SNR EST -IMATORS FOR QPSK MODULATIONS" IEEE COMMUN. LETTERS VOL. 4 PP.43 FEB. 2000