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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶: G11C 11/34, 27/00	A1	(11) International Publication Number: WO 97/22123 (43) International Publication Date: 19 June 1997 (19.06.97)
(21) International Application Number: PCT/US96/19841 (22) International Filing Date: 10 December 1996 (10.12.96) (30) Priority Data: 08/572,077 14 December 1995 (14.12.95) US (71) Applicant (for all designated States except US): INTEL CORPORATION [US/US]; 2200 Mission College Boulevard, Santa Clara, CA 95052 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): FAZIO, Albert [US/US]; 363 Blackwell Drive, Los Gatos, CA 95032 (US). ATWOOD, Gregory, E. [US/US]; 2495 Marsha Way, San Jose, CA 95125 (US). MI, James, O. [US/US]; 1234 Manzano Way, Sunnyvale, CA 94089 (US). RUBY, Paul [US/US]; 107 Briarcliff Court, Folsom, CA 95630 (US). (74) Agents: TAYLOR, Edwin, H. et al.; Blakely, Sokoloff, Taylor & Zafman L.L.P., 7th floor, 12400 Wilshire Boulevard, Los Angeles, CA 90025 (US).		(81) Designated States: AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published With international search report.
(54) Title: PROGRAMMING FLASH MEMORY USING DISTRIBUTED LEARNING METHODS		
(57) Abstract In a memory device including an array of memory cells, each memory cell having more than two possible states, a method for programming a memory cell to a desired state is disclosed. The method comprises a control engine programming a subset (220), wherein the characterization information indicates programming characteristics of a representative memory cell of the array of memory cells (225). The control engine then uses the characterization information to directly program the memory cell to approximately the desired state (230) without performing a program verify operation. <pre> graph TD 215([ERASE ARRAY]) --> 220[PROGRAM SUBSET OF ARRAY USING EXACT PLACEMENT METHOD] 220 --> 225[DERIVE CHARACTERIZATION INFORMATION FOR AVERAGE CELL OF ARRAY] 225 --> 230[PROGRAM CELL DIRECTLY TO DESTINATION STATE USING CHARACTERIZATION INFORMATION] 230 --> 235([END]) </pre>		