

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
16 September 2004 (16.09.2004)

PCT

(10) International Publication Number
WO 2004/079563 A1

(51) International Patent Classification⁷: **G06F 7/60**,
17/10, 11/00, 7/02, H03M 13/00

(21) International Application Number:
PCT/US2003/024730

(22) International Filing Date: 7 August 2003 (07.08.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/450,174 26 February 2003 (26.02.2003) US

(71) Applicant (for all designated States except US): **FLAR-
ION TECHNOLOGIES, INC.** [US/US]; Bedminster
One, 135 Route 202/206 South, Bedminster, NJ 07921
(US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **RICHARDSON,**

Tom [US/US]; 420 Clark Street, South Orange, NJ 07079
(US). **NOVICHKOV, Vladimir** [RU/US]; 625 Beaver
Road, Glenview, IL 60025 (US). **JIN, Hui** [CN/US]; 31
Meadowview Drive, Annendale, NJ 08801 (US).

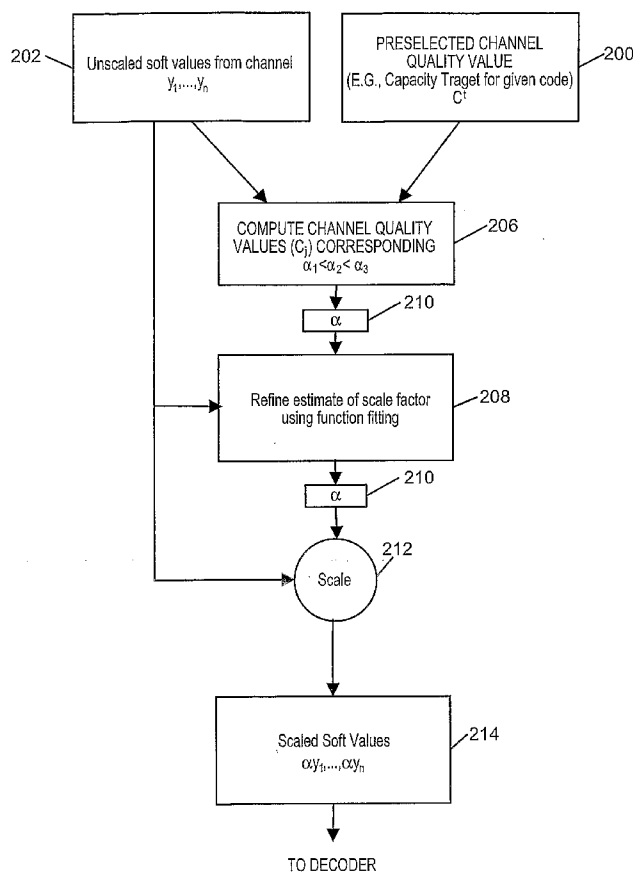
(74) Agent: **STRAUB, Michael, P.**; Straub & Pokotlyo, 620
Tinton Avenue, Bldg. B, 2nd Floor, Tinton Falls, NJ 07724-
3260 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG,
SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN,
YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Continued on next page]

(54) Title: SOFT INFORMATION SCALING FOR ITERATIVE DECODING



(57) Abstract: Methods and apparatus for scaling soft values (214) as part of an error correction decoding process are described. Accurate decoding depends on use of the appropriate scale factor. Selection and use of the scale factor to scale soft values is designed to improve and/or optimize decoder performance without the need for prior knowledge of the correct scale factor or the actual channel conditions at the time the signal from which the soft values were obtained was transmitted through a communications channel. The techniques of the present invention assumes that the soft values to be processed were transmitted through a communications channel having a quality that can be accurately described by a channel quality value (200). A scale factor is determined from the distribution of soft value (208) to be scaled (212) and an assumption that the channel through which they were transmitted was of the quality corresponding to a pre-selected channel quality value (210).



European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR,

TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

Published:

- with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.