Changes Inserted in Second Printing (2007)

p. 47, Notes, line 9 (and bottom of p. 528) [26 Jan 07, thanks to K.T. Phelps]

"Babai *et al.* [26'] and" added before "Petrank and Roth", and the following reference added at the bottom of p. 528:

[26'] L. Babai, H. Oral, K.T. Phelps, *Eulerian self-dual codes, SIAM J. Discrete Math.*, 7 (1994), 325–330 *[2]*.

p. 75, line 3 [07 Feb 06, thanks to G. Polevoy]

"in the set $\{1, \beta, \beta^2, \ldots, \beta^m\}$" changed into "$1, \beta, \beta^2, \ldots, \beta^m$".

p. 79, line 1 (as well as nine other places) [27 Jan 06]

"$(q-1)$st root of unity" changed into "root of order $q-1$ of unity".

Similar change made on pp. 85–86 (Problem 3.36, parts 1 and 5, and Problem 3.37, line 4), p. 91 (line 7 up), p. 179 (line 10 up), p. 180 (line 9 up), p. 240 (last line), p. 325 (Problem 10.14, part 3, line 6), and p. 436 (Problem 13.26, line 3).

p. 88, Problem 3.42, part 2 [19 Sep 06, thanks to I. Tal]

Hint added: "Given an element $\gamma \in \Phi$, compute the value $\mathrm{T}_{\Phi:F}(P_\beta(\gamma))$."

p. 110, lines 6–13 [18 Oct 07]

The text as is holds only for $q = 2$. Otherwise, the Singleton bound may be stronger than the sphere-packing and Elias bounds, and the Elias bound is not $\cup$-convex. Therefore, "$\leq 1 - \delta$" and "$\leq$ Singleton" deleted from lines 6 and 8, and lines 9–12 changed into: "The Singleton bound, $R \leq 1 - \delta + o(1)$, is generally weaker than the sphere-packing and Elias bounds for small values of q; on the other hand, when $q \to \infty$, it actually coincides with the Gilbert–Varshamov bound (up to an additive term $o(1)$)." Also, line 13 changed to start with: "Specializing now to the binary case, the bounds are plotted in Figure 4.1 for $q = 2$."

p. 122, Problem 4.12, line 4 [30 Jul 07]

"$[n, k]$" changed into "$[n, k>0]$".

p. 122, Problem 4.12 [17 Aug 07]

Remark added at the end of the problem: "(The bounds in parts 2 and 3 hold, in fact, also for nonlinear $(n, M>1)$ codes over an alphabet of size q, with k taken as $\log_q M$.)"

p. 127, Problem 4.22, part 3, hint, lines 3–4 [19 Sep 06, thanks to I. Tal]

"there is an index ... such that" deleted, and "$i < i_0$" changed into "$i < t$".

p. 154, line 13 [14 May 06]

Text added after "zero": "(as the multipliers by g_i are now disconnected, their output is assumed to be zero also)".

(The first paragraph of Section 5.4 was squeezed into two lines to make room for this change.)

p. 165, Problem 5.4, part 1 [07 Feb 06, thanks to G. Polevoy]

Last sentence (before the hint) changed into: "(Given μ, there are certain choices of ν for which $\mathcal{C}'_{\text{GRS}}$ will in fact be singly-extended, i.e., one of the code locators α'_j will be zero; still, if $n < |F|$, one can select ν so that each α'_j is nonzero, even when $\mathcal{C}_{\text{GRS}}$ is singly-extended.)"

p. 168, Problem 5.8, part 3, line 4 [19 Sep 06, thanks to I. Tal]

"parity-check" changed into "generator".

p. 171, Problem 5.11, line 7 [19 Sep 06, thanks to I. Tal]

"part 6" changed into "part 5".

p. 174, Problem 5.23, line 1 [19 Sep 06, thanks to I. Tal]

"$d \geq 2$" changed into "$d \geq 3$".

p. 376, line 3 up [06 Sep 07]

"$(z_1, z_2, \ldots, z_N)$" changed to "$(z_1 \; z_2 \; \ldots \; z_N)$".

p. 377, line 14 [19 Sep 06, thanks to I. Tal]

Closing parenthesis added in the exponent: "$q^{n(r-1+\mathsf{H}_q(\theta))}$".

p. 387, line 1 [19 Sep 06, thanks to I. Tal]

"local" changed into "attained neither at δ nor at $1-(1/q)$".

p. 413, last equation in proof [19 Sep 06, thanks to I. Tal]

Rightmost term changed into "$\theta(\theta + \xi - 1)N/\xi$".

p. 427, penultimate line [19 Sep 06, thanks to I. Tal]

Second "$\mathbf{x}$" changed into "λ".

p. 428, Problem 13.12, part 1, line 1 [19 Sep 06, thanks to I. Tal]

"numbers" changed into "number".

p. 430, Problem 3.17 [19 Sep 06, thanks to I. Tal]

"(where $|V'| = |V''|$)" added at the end of the sentence.

p. 434, last line [25 Jun 06]

Sentence after the equation extended by: "(see Jensen's inequality in the notes on Section 1.4)."

p. 435, Problem 13.21, parenthesized paragraph [25 Jun 06]

Paragraph preceded by: "The latter inequality can alternatively be obtained by applying part 2 of Problem 13.20 to the set $T = \mathcal{N}(S)$, in which case $|E_{S,T}| = n|S|$."

p. 438, Problem 13.30, part 4 [19 Sep 06, thanks to I. Tal]

Hint added: "Substitute $\delta = \frac{1}{2}(1-\varepsilon)$ and $\theta = \frac{1}{2} - \frac{1}{3}\varepsilon$ in $(1 - \mathsf{H}_2(\theta))(1 - (\delta/\theta))$."

p. 450, line 27 [14 May 06]

"distance distribution" changed into "weight distribution" (these terms are synonymous for linear codes, but the former term is not defined in the book).

p. 508, Problem 14.15, part 2, hint [19 Sep 06, thanks to I. Tal]

"side" added after "right-hand".

p. 516, Problem 14.31, condition (iii) [19 Sep 06, thanks to I. Tal]

"$F[[x]]$" changed into "$(F[[x]])^k$".

p. 516, Problem 14.32, part 1, line 1 [19 Sep 06, thanks to I. Tal]

"$(F[x])^\ell$" changed into "$(F_\ell[x])^k$".

p. 517, Problem 14.32, part 3, line 3 [19 Sep 06, thanks to I. Tal]

Sentence extended by: "formed by the columns of Q with the same indexes as the columns of $G_0(x)$ within $G(x)$."

p. 542, Reference [238] [20 Jul 06]

Reference updated to point to the journal version: *Lowest density MDS codes over extension alphabets, IEEE Trans. Inform. Theory,* 52 (2006), 3186–3197.

p. 546, Reference [308] [01 Aug 06]

Reference updated to point to the journal version: *IEEE Trans. Inform. Theory,* 52 (2006), 3650–3661.

Index, p. 559 and p. 561 [22 June 06]

Index terms "alternant code (dual code of)" and "dual code (of alternant codes)" now include a reference also to p. 180.

Index, p. 559 and p. 564 [25 Sep 06, thanks to G. Seroussi]

Index terms "bound (Plotkin)" and "Plotkin bound" now include a reference also to p. 37.