Errata and Notes

Mistakes are marked with red and their fixes with blue.

Introduction

1. End of page vi: "which shows the existence of sequences of Goppa codes which exceed the Gilbert-Varshamov bound." should have been: "which shows the existence of sequences of Goppa codes with parameters that exceed the Gilbert-Varshamov bound."

1 Error Correcting Codes

1. Middle of page 3: "This implies that the $n-k$ rows of H are $\mathbb{F}_q$-linearly independent." should have been: "This implies that there exists $n-k$ rows of H which are $\mathbb{F}_q$-linearly independent."

2. Middle of page 5 (in Example 1.21) $P := \{P_1, P_2, \ldots, P_n\}$ should have been: $P := (P_1, P_2, \ldots, P_n)$

2 Algebraic Geometry

Algebraic Preleminaries

1. Middle of page 10 (in the proof of Theorem 2.8): F is both defined as a finite field and a polynomial (Polynomials where originally written using lower case letters.).

Algebraic Geometry

1. Bottom of page 14 (Proposition 2.28 (iii) and the proof of Corollary 2.29): Should have noted that $\mathcal{I}$ may be uncountable, and there is also a spare parenthesis (in 2.28).

2. Midde of page 16 (in the proof of Theorem 2.35): "Then multiplying both sides of Equation (2.1) by Y^n we see that:" should have been: "Then multiplying both sides of Equation (2.1) by Y^k we see that:"

3. Middle of page 19 (Proof of Proposition 2.43): "hence either $F_1(P) = 0$ or $F_2(P)$ for all $P \in V$." should have been: "hence either $F_1 \in I(V)$ or $F_2 \in I(V)$ which is a contradiction."

4. Middle of page 20: Needs an explaination as to why $\Bbbk(\mathcal{X})$ and $\Bbbk(\mathcal{X}^*)$ are isomorphic. However this follows as $\Bbbk[\mathcal{X}]$ and $\Bbbk[\mathcal{X}^*]$ are isomorphic.

Algebraic Plane Curves

1. Third last paragraph, strictly speaking Proposition 2.8 only concerns finite fields with a prime number of elements.

2. Page 25 onwards: The extended valuation v_P, that is to the domain $\overline{\mathbb{F}}_q(\mathcal{X})$ has codomain $\mathbb{Z} \cup \{\pm\infty\}$ not $\mathbb{Z} \cup \{\infty\}$.

3. Bottom of Page 27, onwards: When we speak of a principal divisor (f), i have sometimes assummed that $f \in \overline{\mathbb{F}}_q[\mathcal{X}] \setminus \{0\}$, this is of cause a mistake and should have been $f \in \overline{\mathbb{F}}_q(\mathcal{X}) \setminus \{0\}$.

4. Page 29 (proof of Lemma 2.87): f having no zeros or poles implies that $f \in \overline{\mathbb{F}}_q^*$, however the result still holds as we get $L(D) = \overline{\mathbb{F}}_q^* \cup \{0\}$.

3 Algebraic Geometry Codes

1. Second last paragraph of page 32: "The vector space $L(D)$ will only consist of rational divisors..." should have been: "The vector space $L(D)$ will only be considered when D is rational..."

2. From page 34, onwards: I seem to have forgotten to convert $C_{D,G}$ to $\mathcal{C}_{D,G}$ at some places.