

1. page 10, l -7. “bounded” should be “bound”.
2. page 13, l 21. “coprime is” should be “coprime if”.
3. page 33, l 5. “Hence the” should be “Hence a”.
4. page 33, l 15. “R[i] as” should be “R[i] is”.
5. page 33, l 24. “if and only its” should be “if and only if its”.
6. page 34, line 9. “... with  $P = \dots$ ” should be “with  $P' = \dots$ ”  
Also, line 10. correct  $P^{(i)}$ .
7. page 38, l 21. parenthesis around  $\mu - 1$ .
8. page 36, l-3. 2.11 should be 2.14.
9. page 49, line 26.

$$\begin{aligned}
c(Q = 0, P = 0) &= \text{SQ}(1, P) - \text{SQ}(Q^2, P), \\
c(Q > 0, P = 0) &= \frac{1}{2}(\text{SQ}(Q, P) + \text{SQ}(Q^2, P)), \\
c(Q < 0, P = 0) &= \frac{1}{2}(\text{SQ}(Q, P) - \text{SQ}(Q^2, P)).
\end{aligned}$$

should be

$$\begin{aligned}
c(Q = 0, P = 0) &= \text{SQ}(1, P) - \text{SQ}(Q^2, P), \\
c(Q > 0, P = 0) &= \frac{1}{2}(\text{SQ}(Q^2, P) + \text{SQ}(Q, P)), \\
c(Q < 0, P = 0) &= \frac{1}{2}(\text{SQ}(Q^2, P) - \text{SQ}(Q, P)).
\end{aligned}$$

10. page 59, line -7 replace  $\text{TRem}(P, Q^\alpha)$ , by  $\text{TRem}(P, P'Q^\alpha)$ ,
11. page 60, line 7.  
“Thus the whole projection  $S = S' \cup (S \setminus S')$  is semi-algebraic as the union ...” should replace “Thus the whole projection of  $S = S' \cup (S \setminus S')$  is semi-algebraic since it is the union ...”
12. page 69, l 14. replace  $\xi = 2$  with  $\xi = 1/3$ .
13. page 78, l 2. “Suppose without loss of generality, that  $\frac{\partial P}{\partial Y}(x, y) \dots$ ” should be “Suppose without loss of generality, that  $\frac{\partial P}{\partial Y}(x, y) > 0 \dots$ ”
14. page 93 last line, “We denote by  $u \cdot v \dots$ ” should be “We denote by  $u \cdot u' \dots$ ”
15. page 108 in the underbrace,  $p - q - 2j$  should be  $p - q - j$ .
16. page 122, in paragraph 1 of proof of Lemma 4.58, replace “monomial” by “polynomial” three times.
17. page 125, l 1.
  - $\sum_{x \in Z(\mathcal{P}, \mathbb{C}^k)} e_x = 1$ ,
  - $e_x e_y = 0$  for  $y \neq x$  with  $y, x \in Z(\mathcal{P}, \mathbb{C}^k)$ ,

- $e_x^2 = e_x$ .

Note that as a consequence of these properties,  $e_x(x) = 1$  and  $e_x(y) = 0$  for  $x, y \in Z(\mathcal{P}, \mathbb{C}^k)$  and  $x \neq y$ .

should be

- $\sum_{x \in Z(\mathcal{P}, \mathbb{C}^k)} e_x = 1$ ,
- $e_x e_y = 0$  for  $y \neq x$  with  $y, x \in Z(\mathcal{P}, \mathbb{C}^k)$ ,
- $e_x^2 = e_x$ ,
- $e_x(x) = 1$  for  $x \in Z(\mathcal{P}, \mathbb{C}^k)$ ,
- $e_x(y) = 0$  for  $x, y \in Z(\mathcal{P}, \mathbb{C}^k)$  and  $x \neq y$ .

- page 126, line 17.  $P^M$  should be  $P^N$ .
- page 147, Proof of Theorem 5.21. “If  $S$  is not .... exist open sets ...” should be replaced by “If  $S$  is not .... exist open sets  $O_1, O_2$  ...”
- page 166. Proof of Corollary 5.47. Should be: “It suffices to refine the ... of  $T$  in Theorem 5.46 into a semi-algebraic stratification using Theorem 5.36.” The last sentence of the proof should be deleted.
- page 218, l 7. replace  $\mathbb{R}^{k+1}$  by  $\mathbb{R}^k$ .
- page 220 first line of the proof of (1) and of the proof of (2)  $\mathbb{R}^k$  should be  $\mathbb{R}^{k+1}$  (twice).
- page 233, l 19. replace
 
$$b_i(\mathcal{P}, \mathcal{Q}) \leq b_i(S).$$
 by
 
$$b_i(\mathcal{P}, \mathcal{Q}) = b_i(S).$$
- page 234. omit the last sentence of the proof of Lemma 7.38.
- page 244, In Remark 8.5. “ $O(d \log_2(d) \log_2(\log_2(d)))$  using the Fast Fourier Transform (FFT)” should be “ $O(d \log_2(d))$  using the Fast Fourier Transform (FFT)”
- page 266, l 20. “ $\text{pdet}(P)(X^i)_{n,1} = X^i$  and, by linearity,  $\text{pdet}(P)_{n,1} = P$ .” should be “ $\text{pdet}(P)_{n,1}(X^i) = X^i$  and, by linearity,  $\text{pdet}_{n,1}(P) = P$ .”
- page 268, Notation 8.52 should refer to 4.31 rather 4.22.
- page 273, l -9.

$$\deg(\text{SU}_{j-1}(P, Q)) = q - j, \deg(\text{SV}_{j-1}(P, Q)) = p - j$$

should be

$$\deg(\text{SU}_{j-1}(P, Q)) \leq q - j, \deg(\text{SV}_{j-1}(P, Q)) \leq p - j$$

- page 290, In lemma 9.16, “Suppose  $s = s_0, \dots, s_c, s_{c-1}, \dots, s_{2n-2}$ , with  $2n - 1 \geq c \geq n$ ,  $s_0 = \dots, s_c = 0, s_{c-1} \neq 0$ ,” should be “Suppose  $s = s_0, \dots, s_{c-2}, s_{c-1}, \dots, s_{2n-2}$ , with  $2n - 1 \geq c \geq n$ ,  $s_0 = \dots, s_{c-2} = 0, s_{c-1} \neq 0$ ,”

30. page 291, l 13. Since the associated quadratic form is

$$\Phi = \sum_{i=c+1}^n s_{c-1} f_i f_{n-i}$$

and, if  $n - i \neq i$ ,

$$4f_i f_{n-i} = (f_i + f_{n-1-i})^2 - (f_i - f_{n-i})^2,$$

should be

Since the associated quadratic form is

$$\Phi = \sum_{i=c+1-n}^n s_{c-1} f_i f_{c+1-i}$$

and, if  $c + 1 - i \neq i$ ,

$$4f_i f_{c+1-i} = (f_i + f_{c+1-i})^2 - (f_i - f_{c+1-i})^2,$$

Also,

Defining, for  $t \in [0, 1]$ ,  $s_t = 0, \dots, 0, s_{c-1}, \lambda s_c, \dots, t s_{2n-2}$   
should be

Defining, for  $t \in [0, 1]$ ,  $s_t = 0, \dots, 0, s_{c-1}, t s_c, \dots, t s_{2n-2}$

Also, remove " as well as the multiplicity"

31. page 293, Proposition 9.19. "... the canonical basis  $X^{p-1}, \dots, 1$ ," should be replaced by "... the canonical basis  $X^{p-1}, \dots, 1$ . Then,..."
32. page 338, in Proposition 10.36, replace "Moreover,  $V(b) - V(b') - V(b'')$  is even." by "Moreover, if  $e$  is not a root of  $P$ ,  $V(b) - V(b') - V(b'')$  is even."
33. page 297, l 3. replace " $\bar{R} := \text{sign}(b_1)(pb_1P - P'Q)$ " by " $\bar{R} := P'Q - pb_1P$ ".
34. page 303, l 15.

$$X^{i+1}H_{p-1-i}(P, X) = -X^{j-i-1}(a_i X^i + \dots + a_0) \pmod{P(X)}$$

should be

$$X^{i+1}H_{p-1-i}(P, X) = -(a_i X^i + \dots + a_0) \pmod{P(X)}$$

35. In (9.9) replace  $a_{p-i}$  by  $a_{p-n}$ .
36. page 304 In (9.12) and preceding paragraph replace  $H_{p-1-i}(X, T)$  by  $H_{p-1-i}(P, X)$
37. page 302 and 305 replace  $n \geq r$  by  $n > r$  (twice).
38. page 326, l 3. replace "of degree  $p + q - j$ " by "of degree  $\geq p + q - j$ ".
39. page 329 in remark 10.23, replace "Note that  $B_{p,i}(c, d) = B_{p,p-i}(d, c)$ " by "Note that  $B_{p,i}(c, d) = (-1)^p B_{p,p-i}(d, c)$ "
40. page 330, in the statement of Proposition 10.24, replace  
"Let  $P = \sum_{i=0}^p b_i B_{p,i}(d, c) \in \mathbb{R}[X]$  be of degree  $\leq p$ ." by "Let  $P = \sum_{i=0}^p b_i B_{p,i}(c, d) \in \mathbb{R}[X]$   
be of degree  $\leq p$ ."

41. page 334 in Proof of correctness, replace “ $\tilde{b}$  represents  $P$ ” by “ $\tilde{b}$  represents  $(-1)^p P$ ”
42. page 338, in the proof of Proposition 10.36 replace ”It is clear that  $V(b^{(p)}) = V(b') + V(b'')$ .” by “If  $P(e) \neq 0$ , it is clear that  $V(b^{(p)}) = V(b') + V(b'')$ , since  $b_0^{(p)} = P(e) \neq 0$ .”
43. page 351, “ $\text{Sign}(P_{i-1}, Z)$ ” should be “ $\text{Sign}(\mathcal{P}_{i-1}, Z)$ ” (four times) “ $\text{Sign}(P_i, Z)$ ” should be “ $\text{Sign}(\mathcal{P}_i, Z)$ ” (twice).
44. page 351, 1 -3. “for every  $\sigma$  in  $\text{Sign}(\mathcal{P}_{i-1}, Z)_1$ ” should be “for every  $\sigma$  in  $\text{Sign}(\mathcal{P}_{i-1}, Z) \setminus \text{Sign}(\mathcal{P}_{i-1}, Z)_2$ ”
45. page 352, 1 3. “for every  $\sigma$  in  $\text{Sign}(\mathcal{P}_{i-1}, Z)_2$ ” should be “for every  $\sigma$  in  $\text{Sign}(\mathcal{P}_{i-1}, Z)_2 \setminus \text{Sign}(\mathcal{P}_{i-1}, Z)_3$ ”
46. page 352, 1 -16.  
replace  
“ Initialization:  $\text{Sign}(\mathcal{P}_r, \mathcal{Z}) := \emptyset, \mathcal{A}_r(\mathcal{Z}) := \emptyset.$ ”  
by  
“Initialization:  $\text{Sign}(\mathcal{P}_r, \mathcal{Z}) := \{\emptyset\}, \mathcal{A}_r(\mathcal{Z}) := \{\emptyset\}.$ ”
47. page 353. the last paragraph of the algorithm, which begins ”Let  $\text{Sign}(\mathcal{P}_{i-1}, Z)_1$ , the 1 should be 2, and the 2 immediately following that should be 3. On the same paragraph, fourth line,  $M(\mathcal{P} \dots)$  lacks the ”,  $\text{Sign}(\mathcal{P}_{i-1}, Z)$ ” at the end.
48. page 355, 1 2.  $SQ(P, P_1 P_2)$  should be  $SQ(P_1 P_2, Z)$
49. page 356, the equality should be

$$\begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & -1 & 1 & -1 \\ 1 & 1 & -1 & -1 \\ 1 & -1 & -1 & 1 \end{bmatrix} \begin{bmatrix} c(P_1 > 0, P_2 > 0, P_3 > 0, Z) \\ c(P_1 > 0, P_2 > 0, P_3 < 0, Z) \\ c(P_1 < 0, P_2 < 0, P_3 > 0, Z) \\ c(P_1 < 0, P_2 < 0, P_3 < 0, Z) \end{bmatrix} = \begin{bmatrix} 3 \\ -1 \\ 1 \\ 1 \end{bmatrix}.$$

50. page 357. In the proof of Lemma 10.60,  $\text{Sign}(\mathcal{P} \cup \{P\}, Z)_1$  should be  $\text{Sign}(\mathcal{P} \cup \{P\}, Z)_2$  and  $\text{Sign}(\mathcal{P} \cup \{P\}, Z)_2$  should be  $\text{Sign}(\mathcal{P} \cup \{P\}, Z)_3$  all over.
51. form of  $X_1^3 + X_1$ ” should be “the normal form of  $X_1^3 + X_1 + X_2$ ”.
52. page 344. Definition of isolating list.  $L$  is undefined. should be: “...is a finite list,  $L$ , of ...”
53. page 354. Example 10.58. Replace “ $Q = (X^3 - 1)(X^2 - 9)$ ” by “ $P = (X^3 - 1)(X^2 - 9)$ ” .  $Z(P, \mathbb{Q})$  in the next line should be  $Z(P, \mathbb{R})$ .
54. page 352, line -16.  
Replace  
“Initialization:  $\text{Sign}(\mathcal{P}_r, \mathcal{Z}) := \emptyset, \mathcal{A}_r(\mathcal{Z}) := \emptyset.$ ”  
by  
“Initialization:  $\text{Sign}(\mathcal{P}_r, \mathcal{Z}) := \{\emptyset\}, \mathcal{A}_r(\mathcal{Z}) := \{\emptyset\}.$ ”
55. page 376, lines 1-2. Remove misleading part of the sentence: “and such that, for every  $i$ ,  $Q_i$  is...”
56. page 377, line 4. and page 379, line 2. Replace “If” by “Else if”.

57. page 377, line 6, and page 379, line 4. Replace “Read ...” by “For each  $X^\gamma$  in the sum above, read ...”.
58. page 377, index in the 2nd  $\sum$ . Insert “)”.
59. page 377, p. 379, expression in the 3rd  $\sum$ . Remove “)”.
60. page 378, l.-9. Replace “ $b(Y)^{|\beta|}Y^\alpha$ ” by “ $b(Y)^{|\beta|}X^\beta$ ”.
61. page 382 l.14. “in D” should be “in D[Y]”.
62. page 382 l.21 “((“ should be “(“ (remove extra ‘(’).
63. page 391, Lemma 11.37 b) “ $C\langle\epsilon\rangle_b$ ” should be “C” (as  $t_1$  is a root in C, not in  $C\langle\epsilon\rangle_b$ ) ; other roots modified similarly.
64. page 394, l.4 of Lemma 11.42. Replace “ $\phi_i$ ” by “ $\phi$ ”.
65. page 401, line 17 “11.31” should be “11.30”.
66. page 403, lines 7,8. Replace “each halfspace defined by  $X_{k+1} = 0$ ” by “each of the halfspaces defined, respectively, by  $X_{k+1} > 0$  and by  $X_{k+1} < 0$ ”.
67. page 403. Proposition 11.47, line 3. “Ext( $Z'$ ,  $R\langle\epsilon\rangle$ ) of  $Z'$ ” should be replaced by “Ext( $Z$ ,  $R\langle\epsilon\rangle$ ) of  $Z$ .”
68. page 403, line 17 Replace “inside  $Z$ ” by “inside Ext( $Z$ ,  $R\langle\epsilon\rangle$ )”.
69. page 404. The remark “Note that  $\forall x \in B(0, 1/c)$ ,  $G_k(\bar{d}, c)(x) > 0$ ” should appear just before remark 11.49.
70. page 404. Remove the sentence “Note that  $\forall x \in B(0, 1/c)$ ,  $G_k(\bar{d}, c)(x) < 0$ .” from the notation and put it at line -3.
71. page 405, Prop. 11.50, last part. remove “lim $_\zeta$ ”.
72. page 406, l.5. Proposition 3.21 should be Lemma 3.21.
73. page 407. replace

$$\lim_{\zeta}(\mathbb{Z}(\text{Def}_+(Q, \bar{d}, c, \zeta), R\langle\zeta\rangle^{k+1})) = \mathbb{Z}(Q, R^k)$$

by

$$\lim_{\zeta}(\mathbb{Z}(\text{Def}_+(Q, \bar{d}, c, \zeta), R\langle\zeta\rangle^{k+1})) = \mathbb{Z}(Q, R^k) \times \{0\},$$

in the statement of Lemma 11.53

74. page 409 and 410. Proof of Prop 11. 57  $I(\text{Cr}(Q, \bar{d}, c, \zeta), R\langle\zeta\rangle^k)$  should be replaced by  $I(\text{Cr}(Q, \bar{d}, c, \zeta), R\langle\zeta\rangle)$ ,  $I(\text{Cr}(Q, \bar{d}, c, b), R\langle\zeta\rangle^k)$  should be replaced by  $I(\text{Cr}(Q, \bar{d}, c, b), R)$ ,  $\mathbb{Z}(\text{Cr}(Q, \bar{d}, c, b), C\langle\zeta\rangle^k)$  should be replaced by  $\mathbb{Z}(\text{Cr}(Q, \bar{d}, c, b), C^k)$ ,

$$A_\zeta = R\langle\zeta\rangle[X_1, \dots, X_k]/(\text{Cr}(Q, \bar{d}, c, \zeta))$$

should be replaced by

$$A_\zeta = R\langle\zeta\rangle[X_1, \dots, X_k]/I(\text{Cr}(Q, \bar{d}, c, \zeta), R\langle\zeta\rangle).$$

75. page 410.  $\deg_{X_j}(R) < \bar{d}_j - 1, j \neq i, 2 \leq j \leq k$ . should be replaced by  $\deg_{X_j}(R) < \bar{d}_j - 1, 2 \leq j \leq k$ .
76. page 411, “ $B(0, c)$ ” to be replaced by “ $B(0, 1/c)$ ”.
77. page 411. Output of Algo 11.60 and 11.61  $\{f, g_0, \dots, g_k\} \subset D[\varepsilon][T]^{k+2}$ . to be replaced by  $\{f, g_0, \dots, g_k\} \subset D[\varepsilon][T]$ .
78. page 414, last line in Complexity analysis. “ $O(\dots)$ ” should be “ $O(\dots))$ ” (missing closing bracket).
79. page 418, line 2. Lemma 7.25 holds only over the reals. There has to be an application of the transfer principle.
80. page 433, line 3.  $P[X_1, \dots, X_{k_1}]$  should be  $P[X_1, \dots, X_k]$
81. page 460, line 5. “so is as the...” should be “so is the”.
82. page 517. “ $d_{k-k', \ell}$ ” (not “ $dk - k', \ell$ ”).
83. Lemma 15.3 “ $B(0, c)$ ” to be replaced by “ $B(0, 1/c)$ ”.
84. page 443, l 19.  $F(X_1, \dots, X_k)$  should be  $F(Y_1, \dots, Y_\ell, X_1, \dots, X_k)$ .
85. page 450, l 7. “is a set of dimension 1 i.e. a finite set of points” should be “is a set of dimension 0 i.e. a finite set of points”
86. page 450 and 453, several times  $D'$  should be  $D$ .
87. page 453 Bottom of the page in (i), should be Corollary 9.9 rather than Corollary 9.8
88. page 453, 454. in the Sturm queries,  $Z_{x_1}$  should be replaced by  $P(x_1, X_2)$  many times, also one  $Z$  should be replaced by  $P(x_1, X_2)$ . Also  $c(X_2 - y, P(x_1, X_2) = 0) = 0$  should be  $c(X_2 - y = 0, P(x_1, X_2) = 0) = 0$ .
89. page 517, last line.  $d_{k-k', \ell}$  (not  $dk_{-k', \ell}$ ).
90. page 524. In the statement of Prop 15.1 and 15.2 all the  $S$  should be  $D$ .
91. page 525. Lemma 15.3  $B(0, c)$  to be replaced by  $B(0, 1/c)$
92. page 532. Algorithm 15.9 Step 5, first line. should be “ $u = (f, g_0, g_{i+1}, \dots, g_k)$ ” instead of “ $u = (f, g_0, g_i, \dots, g_k)$ ”.
93. page 535, last line. it should be  $c'(P)$  instead of  $c(P)$ .
94. page 541, line 12. replace  $\sigma, \rho$  by  $\sigma, \rho, \tau$
95. page 573, line -6. In the complexity analysis should be Step 4 not Step 3.
96. In the Reference BPR95b should be replaced by:
- S. BASU, R. POLLACK, M.-F. ROY, *On Computing a Set of Points meeting every Semi-algebraically Connected Component of a Family of Polynomials on a Variety*, Journal of Complexity, March 1997, Vol 13, Number 1, 28-37.
97. page 587, reference 27. Eigenshaften should be Eigenschaften
98. page 590, reference 76. Über should be replaced by Über

99. page 509. The title should be "Über die Bedingungen, unter welchen eine Gleichung nur Wurzeln mit negativen reellen Theilen besitzt."