Introduction

This is a bibliography of material on floating-point arithmetic that I came up with while doing research on a floating-point package of my own. I don’t claim it to be anywhere near complete. The material listed is only what I myself possess.

My main interest was in software based, binary floating-point arithmetic on a microprocessor, so you won’t find much material about the hardware used in floating-point arithmetic (e.g. adders, carry propagation schemes, higher radix
representation for multiplication and division, etc.) in this list. There is also not too much on non-binary floating-point arithmetic.

For most fields covered in this bibliography, the important or historically relevant articles should be included. There is also some material on integer arithmetic in this list as some of the methods used with integer arithmetic contain interesting ideas that may be useful in the realization of a floating-point arithmetic package.

Also, depending on the type of microprocessor used, one may need to implement integer multiplication and division for use in the floating-point package, so articles about this topic are included as well.

As I am German, there is a bit of material in German in this bibliography. However, English translations are provided for all non-English titles.

Thanks to the people who have helped me with previous versions of this document by sending me papers or additional references:

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- Jim Kiernan (jmk@teak.cray.com),
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- Nhuan Doduc (ndoduc@framentec.fr),
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- Nelson H. F. Beebe (beebe@math.utah.edu).

Bibliography entries in the Books section are ordered alphabetically by author; ordering is by ascending year in the remaining sections.

[Warning: it has yet not been possible to bring this citation list up-to-date with the entries in the Bibliography entries in the Books section are ordered alphabetically by author; ordering is by ascending year in the remaining sections.

Books, hardware oriented

[1721, 281, 1286, 1216, 3111, 3315, 1916, 841, 1164, 1000, 1457, 843, 1343, 7218, 7219, 1557]

Books, software oriented or theory

[1273, 466, 469, 470, 119, 1420, 2393, 908, 1049, 352, 2952, 2434, 2969, 2270, 320, 527, 7072]

Books, machine specific

[2175, 3217, 3113, 2436, 1767, 1903, 2289, 1935, 2471]
1 CHOICE OF BASE, FLOATING POINT FORMATS

Journal Publications, Conference Papers, Technical Reports, Ph.D. Dissertations, Book Contributions, etc.

1 Choice of base, floating point formats

[498, 750, 752, 730, 893, 1141, 1131, 2036, 2267, 2391, 2544, 2771, 2785]

1.1 Precision and Rounding

[433, 558, 745, 837, 881, 896, 946, 1032, 1041, 1045, 1194, 1296, 1435, 1376, 1538, 1729, 2280, 2456, 2529, 2842, 3158, 3280]

1.2 Determination of parameters of floating point arithmetic

[686, 823, 1636, 2273, 2201]

1.3 IEEE standards for floating point arithmetic

[993, 1197, 1223, 1206, 1234, 1196, 1203, 1340, 1326, 1327, 1280, 1300, 1458, 1385, 1409, 1387, 1725, 1824, 1862, 1863, 1860, 2087, 2172, 2339, 2573, 3053]

1.4 Floating point arithmetic, general and implementation issues

[633, 719, 1014, 1035, 1083, 1095, 1094, 1236, 1238, 1210, 1274, 1266, 1475, 1493, 1992, 2012, 2217, 2218, 2372, 2446, 2349, 2528, 2772, 2773, 2701, 2770, 3011]

1.5 Floating point packages

[1287, 1700, 1679, 1773, 1731, 1884, 1849, 1885, 1967, 2080, 2102, 2204, 2298, 2299, 2300, 2479, 2480, 1352]

1.6 Floating point units

1.7 Test of floating point routines

2 Addition and Subtraction
[375, 1513]

2.1 Floating-point Summation
[325, 345, 362, 361, 570, 639, 677, 831, 1661, 2275, 2352]

2.2 Multiplication
[680, 1246, 1260, 1476, 1543, 1516, 1574, 1601, 1593, 1619, 1676, 1591, 1758]

2.3 Division
[209, 238, 223, 322, 348, 438, 1017, 1064, 1311, 1403, 1567, 1645, 1623, 1606, 1770, 1890, 2015, 1994, 2387, 2777, 2722, 2967, 3016, 7240, 2949]

3 Elementary functions, general
[384, 398, 586, 650, 615, 1122, 1265, 1627, 1656, 1756, 1719, 1717, 1794, 1840, 7159, 1945, 2051, 2154, 2098, 2277, 7178, 2560, 2597, 2547, 3334, 2549, 2518, 2697, 2850, 2661, 2812, 2813, 2690, 3367, 3335]

3.1 Elementary functions, CORDIC and related algorithms
[190, 191, 248, 264, 373, 523, 551, 659, 651, 667, 733, 855, 1068, 1084, 1293, 1451, 1699, 1897, 1708, 1811, 1963, 2159, 2381, 2310, 2541, 2567, 2716, 2810, 3010, 3005, 3128, 3068, 3114]

3.2 Elementary functions, function approximation
[240, 241, 481, 623, 768, 767, 983, 1021, 1162, 2000, 2052, 2610, 2685, 2783, 2784]

3.2.1 Polynomial evaluation
[259, 279, 304, 426, 1061, 1228, 2351]
3.3 Square root, general
[1082, 1187, 1481, 1598, 1651, 2565, 2677]

3.3.1 Square root, bit-oriented, iterative, and table methods of computation
[120, 153, 359, 1022, 1008, 1151, 1353, 1444, 1406, 1372, 1426, 1537, 1825, 1922, 1834, 1887, 1971, 1952, 2006, 2046, 2089, 2139, 2179, 2253, 2390, 2577, 2534, 2709, 3038]

3.3.2 Square root, Newton’s method

3.4 Sine and Cosine
[180, 1068, 1018, 1023, 1176, 1398, 1544, 1666, 1665, 1765, 1853, 1953, 2120, 2231, 2606, 2961, 2958, 2880, 2980, 3074]

3.5 Logarithm
[154, 271, 331, 690, 998, 1112, 1299, 1529, 2107, 2108, 2607, 2735]

3.6 Exponential function
[141, 409, 1183, 1361, 1518, 1748, 1847, 2470, 2608, 3002]

3.7 Arctangent
[143, 160, 207]

3.8 Other transcendental functions
[499, 613, 161, 1024, 365, 275, 360, 2100, 1157, 2860, 3054]

4 Binary-decimal conversion
5 BCD arithmetic
[674, 726, 777, 778, 779, 780, 781, 782, 783, 1382, 1492, 1705, 1640, 2037, 2646, 2960]

6 Multiple precision arithmetic
[292, 330, 410, 428, 632, 616, 953, 1002, 1099, 1098, 1265, 1350, 1430, 1542, 2805, 2789, 3033, 3224]

7 Conferences on computer arithmetic
[7098, 7108, 7113, 7122, 7125, 7138, 7156, 7157, 7199, 7229, 7237, 7231, 7263]

8 Additional contributions from Nelson H. F. Beebe

Title word cross-reference

#26 [5487].

(2^n)^m [3796]. (10^{31} - 1)/9 [1976]. (2^n) [4349, 4370, 4553, 4562, 4468]. (2^n + 1) [1081, 4785, 3909]. (2^n - 1) [5004]. (2^n - 1, 2^{n+p}, 2^n + 1) [6266]. (2^n 2^m) [6072]. (2^n + 1) [5514, 4136]. (2^n) [4433]. (2^n + 3) [6521]. (2^n - (2p + 1)) [4847]. (a \cdot x) \cdot x? [6794]. (d, r) [789]. (M, p, k) [5800]. (R) [2908]. (p) [4349, 4433].
8 ADDITIONAL CONTRIBUTIONS FROM NELSON H. F. BEEBE

\[ r \geq 8 \quad [5843]. \quad s \quad [4874]. \quad \sin(BIG) \quad [5230]. \quad \sin^{-1} \quad [3128]. \quad \sin N \quad [180]. \quad \sin x \quad [373]. \quad \sqrt{a^2 + b^2} \quad [6274]. \quad \sqrt{x} \quad [1481]. \quad \sqrt{x/d} \quad [3844]. \quad \sqrt{2} \quad [6968]. \quad \sqrt{x} \quad [1307, 451]. \quad \sqrt{x^2 + y^2} \quad [5669]. \quad T \quad [6559]. \quad \tan^{-1} x \quad [373]. \quad \theta \log N \quad [2354]. \quad x \quad [4064, 3914, 4130]. \quad w \quad [4730]. \quad X \quad [1542, 2893]. \quad x^2 + ny^2 \quad [3706]. \quad x^n \quad [5972, 3307]. \quad y \quad [4412]. \quad Z \quad [5327]. \]

-2 \quad [1004]. \quad -adic \quad [1130, 1044, 1635, 2059, 894]. \quad -approximations \quad [5248, 5249]. \quad -ary \quad [5249]. \quad -body \quad [4573, 4923]. \quad -circulant \quad [6402]. \quad -Coordinate \quad [4412]. \quad -count \quad [6559]. \quad -D \quad [5669, 4177, 4201, 3283, 6203, 4117, 5093, 3361, 2165]. \quad -Depth \quad [3431]. \quad -Digit \quad [433]. \quad -Dimensional \quad [5497, 2049, 4691]. \quad -Fold \quad [5435]. \quad -Friendly \quad [5800]. \quad -function \quad [5166]. \quad -gram \quad [5680]. \quad -Matrix \quad [4834]. \quad -Moduli \quad [6008, 3967, 4657, 4797]. \quad -Norms \quad [6047]. \quad -Order \quad [3602]. \quad -Partition \quad [5991]. \quad -Real \quad [4938]. \quad -select \quad [4158]. \quad -sets \quad [3061]. \quad -spaces \quad [4874]. \quad -th \quad [5908, 3802, 5773, 2334]. \quad -transform \quad [5327]. \quad -Vectors \quad [6047].

.NET \quad [6412, 5068].

/ \quad m \quad [4863]. \quad /spl \quad [4863].

0.18-CMOS \quad [5767]. \quad 0.4.1rc \quad [6413]. \quad 0.80pJ \quad [6547]. \quad 0.80pJ/flop \quad [6547].

'00 \quad [7339, 7344, 2540]. \quad '01 \quad [7353]. \quad '03 \quad [7382]. \quad '04 \quad [7391, 7399]. \quad '07 \quad [7434, 7440, 7442, 7447]. \quad '08 \quad [7451, 3032, 5375].

1 \quad [217, 3547, 6633, 3412, 2876, 228, 63, 65, 67, 563, 3275, 6665, 4064, 4406, 1163, 5767, 1933, 3864]. \quad 1-GHz \quad [6633, 4406, 5767]. \quad 1-Output \quad [5341]. \quad 1.0 \quad [3865]. \quad 1.24Tflop \quad [6547]. \quad 1.24Tflop/sW \quad [6547]. \quad 1.5 \quad [5649]. \quad 10 \quad [5731]. \quad 10-ka \quad [5731]. \quad 10-ka/cm \quad [5731]. \quad 10/20 \quad [958]. \quad 100 \quad [2889, 2890]. \quad 100-MFLOPS \quad [2889, 2890]. \quad 1014 \quad [6738]. \quad 1057 \quad [1981]. \quad 10858 \quad [1746]. \quad 10967 \quad [4360, 5155].

10967-1 \quad [3275]. \quad 10967-2 \quad [4360]. \quad 10967-3 \quad [5155]. \quad 10th \quad [7149, 7483, 7231, 7360, 7367, 737, 7130, 2763]. \quad '11 \quad [7478, 1110, 1391, 1507, 1408, 1312]. \quad 11-bit \quad [4005].

11/780 \quad [2036, 1569, 1570, 1803, 1019]. \quad 116 \quad [270]. \quad 1164/WTL \quad [2033]. \quad 11i \quad [4920]. \quad 11th \quad [7351, 7244, 7262, 7263, 3183]. \quad 120B \quad [1120]. \quad 128-bit \quad [6314, 4115].

12th \quad [7394, 7460, 7105, 7286, 3454, 7446]. \quad 13 \quad [4319, 2090]. \quad 132-Bit \quad [342].

13th \quad [7379, 7121, 7305, 7275, 7433, 3843, 3771, 7503]. \quad 14-Port \quad [3914]. \quad 14th \quad [7266, 7350, 7381, 7432, 7344, 7330]. \quad 15 \quad [2766]. \quad 15-bit \quad [4451]. \quad 15B \quad [4120]. \quad 15C \quad [1629].

15th \quad [7169, 7440, 7105, 7448, 7352, 7398]. \quad 16-19 \quad [7069]. \quad 16-b \quad [6448].

16-bit \quad [4530, 6673, 6688, 7034, 6831, 3023, 1260, 1601, 4989, 3076, 1759, 6313, 1476]. \quad 16-bit-Multiplikation \quad [1476]. \quad 16-by-8-bit \quad [1645].

16-Digit \quad [5361]. \quad 160-ns \quad [2835]. \quad 160-Word \quad [3914]. \quad 1620 \quad [255]. \quad 164 \quad [1815]. \quad 167 \quad [3491, 3529]. \quad 16BST \quad [1817, 1733, 1734, 1736, 1740, 1750, 1763, 1772].

16F/400 \quad [917]. \quad 16th \quad [7423, 7414, 4646, 7378, 7420]. \quad 17 \quad [287, 838]. \quad 17-Bit \quad [648, 647]. \quad 1788 \quad [6535]. \quad 1788-2015 \quad [6061]. \quad 17th \quad [7485, 7425, 7341, 7415, 7418].

'18 \quad [7496, 562]. \quad 18-21 \quad [7431]. \quad 18.Mai \quad [1484]. \quad 18th \quad [7450, 7439, 7445, 5467].
8 ADDITIONAL CONTRIBUTIONS FROM NELSON H. F. BEEBE


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80960KB [2242], 80b [2443], 80h [1295], 80's [7120], 814 [4439], 8231A [4140], 826 [6383], '83 [7141], 83587 [2512], '84 [7150], 842 [4994], '85 [7155, 480], '86 [7163], 86\textsuperscript{T.M} [3913], 871 [5438], '88 [7184, 7185, 7188, 2305], '89 [7196, 7203], 89/\textsc{ti} [4452, 4453], 8s [765], 8th [7208, 7408, 7317, 7170, 5616], 9 [516, 695], 9-11 [7436], 9.4 [6811], '90 [7206, 7215, 7230, 4295, 3385, 4954, 4955, 2675, 3481, 4439, 3829], 908 [5645], 90nm [4786], '91 [7227, 7230, 416, 395], '92 [7236, 7239, 7242, 7250, 4452, 4453], '93 [7253], '94 [7265, 7266, 7275], '95 [7282, 3842, 4452, 4746], 954 [6039], '96 [7296, 7300], 96-bit [2255], 97 [3707], '98 [7313, 7321, 3959, 7311], 980A [1015], '99 [7326, 7327, 7328], 9th [7199, 7474, 7431, 7133, 2356].

\begin{itemize}
8 ADDITIONAL CONTRIBUTIONS FROM NELSON H. F. BEEBE

428, 4012, 4829, 6147, 5503, 3431, 4844, 3601, 3753, 4028, 4546, 4030, 4199, 4200, 6516, 2381, 2716, 1617, 5008, 5716, 5718, 740, 3447, 972, 5516, 2090, 5732, 1630, 1873, 5304, 3288, 2735, 828, 6887, 5915, 6070, 3437, 313, 5309, 5310, 4059, 2421, 5033, 1048, 5599.

Algorithm [2105, 569, 2107, 262, 640, 4723, 2113, 6898, 762, 2947, 1649, 1890, 2115, 2254, 5330, 2566, 6183, 6423, 1654, 1897, 4410, 2774, 2960, 4412, 1532, 1661, 2777, 2778, 3660, 5993, 4894, 5424, 5758, 1157, 2589, 6099, 4900, 923, 2139, 924, 775, 4608, 1243, 2015, 5628, 6001, 372, 3814, 4112, 3184, 4117, 4447, 5085, 1693, 6204, 456, 4455, 2822, 3518, 2155, 489, 5552, 5773, 5857, 5945, 595, 3698, 1478, 244, 3206, 3531, 5104, 4278, 2630, 1710, 603, 2173, 2040, 4780, 6459, 3549, 3849, 5237, 6353, 3399, 1582, 1720, 4799, 2661, 2662, 3403, 5125, 3229, 2669, 2507, 3979, 3567, 3412, 5686, 3726.

algorithm [3415, 3238, 4331, 4332, 3869, 3870, 6251, 3578, 3070, 465, 4680, 4682, 4900, 4007, 3579, 1204, 5283, 4833, 2215, 5815, 5700, 6257, 4900, 923, 775, 4608, 1243, 2015, 5628, 6001, 372, 3814, 4112, 3184, 4117, 4447, 5085, 1693, 6204, 456, 4455, 2822, 3518, 2155, 489, 5552, 5773, 5857, 5945, 595, 3698, 1478, 244, 3206, 3531, 5104, 4278, 2630, 1710, 603, 2173, 2040, 4780, 6459, 3549, 3849, 5237, 6353, 3399, 1582, 1720, 4799, 2661, 2662, 3403, 5125, 3229, 2669, 2507, 3979, 3567, 3412, 5686, 3726.

8 ADDITIONAL CONTRIBUTIONS FROM NELSON H. F. BEEBE

741, 2918, 4377, 2411, 3116, 4569, 1754, 2422, 3779, 830, 1755, 1882, 1637, 5601, 7331, 7342, 7358, 7371, 7385, 7402, 4065, 2561, 4725, 3131, 2756, 5044, 5179, 2433, 2565, 5181, 5416, 6425, 4076, 5844, 4078, 1442, 1663, 5612, 6190, 2266, 4895, 2452, 4599, 2591, 4088, 3928, 4607, 3166, 3167, 3504, 5344, 2462, 1784, 2023, 5208, 4759, 3000, 1073, 2823, 3191, 492, 1703. algorithms [4932, 5370, 3018, 4940, 2345, 2046, 7175, 7189, 357, 2006, 1061, 1537, 4663].

ADDITIONAL CONTRIBUTIONS FROM NELSON H. F. BEEBE

747, 1224, 519, 1225, 1226, 4377, 6408, 3772, 1882, 1637, 524, 2246, 4236, 1647, 1648, 5530, 5045, 5327, 363, 403, 2440, 2117, 2954, 2955, 835, 3143, 984, 2959, 3144, 3339, 5039, 3929, 840, 3171, 3172, 3339, 3505, 1065, 5197, 1546, 3344, 3688, 2291, 1924, 375, 3820, 3821, 4448, 1175, 7204, 2825, 3194, 1251, 715, 794, 3007, 5639, 1703, 3833, 1182, 2624, 3836, 6643, 1816, 7232.

8 ADDITIONAL CONTRIBUTIONS FROM NELSON H. F. BEEBE

6431, 1539, 372, 2289, 1553, 6934, 7095, 6606, 4811, 7265, 6946, 1185, 3022.

applications [1485, 2312, 5954, 3220, 1490, 4150, 7351, 7197, 5679, 2056, 5878, 2335, 1727, 3417, 3729, 6645, 2684, 6251, 1839, 2365, 5140, 4696, 4022, 5003, 6505, 4195, 5714, 7050, 5974, 6399, 3103, 3450, 748, 2415, 7259, 2932, 7173, 2558, 2942, 316, 4884, 4590, 3148, 2585, 5762, 7130, 5940, 3501, 3511, 2018, 790, 455, 17, 3190, 7249, 1351, 5777, 1704, 5369, 1975, 1700, 7095].

Applied [7266, 7143, 548, 1194, 3562, 6380, 1128, 7426, 5003, 7486, 7069, 5341, 7161, 7503, 2045, 2319, 2710, 3613, 7426, 7396, 7483].

Approaching [2183].

Approved [6520].

Approach [6730, 6017, 4145, 3392, 4312, 1723, 1103, 5261, 3574, 6492, 5276, 6496, 5809, 1840, 5698, 736, 6152, 5509, 1723, 7293, 7365, 7482, 6513, 5399, 3887, 5514, 5590, 1137, 7139, 1992, 6899, 1438, 1154, 7216, 4421, 2130, 1450, 3162, 3678, 6341, 5560, 3376, 3377, 1079, 1184, 2177, 2044, 1269, 2932, 7173, 2558, 2942, 316, 4884, 4590, 3148, 2585, 5762, 7130, 5940, 3501, 3511, 2018, 790, 455, 17, 3190, 7249, 1351, 5777, 1704, 5369, 1975, 1700, 7095].
3271, 5152, 7213, 7228, 7367, 4204, 4703, 4704, 6273, 6396, 6401, 5732, 2094, 2916, 3618, 4215, 4554, 1422, 4557, 4559, 6068, 5309, 6168, 1312, 1881, 4227, 3296, 6309, 6315, 2949, 7274, 4240, 6799, 6907, 3315, 7216, 5932, 5993, 4255, 4894, 5422, 6917, 6695, 6099, 993, 4603, 2993, 7192, 1679, 6571, 4433, 6926.

Architecture [2803, 2985, 3507, 6703, 2150, 5211, 5355, 1467, 5773, 5945, 1469, 3360, 3362, 7040, 6711, 4770, 6713, 1083, 4487, 6455, 2636, 4780, 3386, 1810, 5801, 2661, 3229, 3051, 4163, 4670, 2347, 2064, 7145, 2367, 4839, 1972, 3593, 5511, 2222, 7093, 4705, 2722, 5402, 2228, 2229, 2395, 2396, 2402, 2546, 4217, 2736, 2412, 2413, 3901, 2241, 3773, 2420, 4870, 3909, 1760, 4871, 2559, 2754, 2755, 2252, 5415, 5608, 5054, 2570, 3657, 480, 2265, 4259, 3666, 6191, 2587, 2588, 1062, 7130, 5067, 2281, 5770, 3514, 935, 1339, 4757, 4761, 1788, 2295, 3198, 1704, 2163, 6007, 3374, 4849, 2109, 2248, Arcsin [161]. Arctan [160, 651]. Arctangent [1630, 3277].

Asia [7327]. Asian [7272]. ASIC [7236, 7361, 7419, 5133, 7256, 7327, 5515, 3181, 3017]. ASICON [7419]. ASICs [7327, 3850].
Aspekte [1236, 1885]. Aspen [7278]. ASPLOS [7195]. ASPLOS-III [7195].
Assembler [4452]. Assembly [1507, 1400, 3287, 3454, 3520, 3014, 1733, 2818]. Asserting [4536]. Assertion [6347, 6430].
Assertions [3395, 3737]. Assessing [6635, 6144, 3910, 4066]. Assessment [7303, 2914, 6075]. ASSETS [7406].
assignment [2568]. Assimilations [286]. Assistance [4205, 4720]. Assistant [7002, 5119, 5934].
Assisted [3646, 6110, 1705, 4131, 4133, 4630]. Associate [1904]. Associated [5677, 106, 4407, 2968].
Association [7134, 1331]. Associative [2874, 6372, 6007, 2124, 3660, 1682, 4617, 2281, 2979]. Assurance [7165].
Asymmetric [5256, 6492, 5024, 4404, 5626]. asymptotic [4965, 3575, 818, 2013]. Asymptotically [6274, 5228, 6624].
Asynchronous [1375, 5627, 5852, 3428, 3310, 4613]. AT&T [2214, 3091]. AT-based [2265]. Atan2 [6031]. Atanasoff [4045, 5630].
Atari [2067]. Athens [7097]. Athlon [4261]. Atkin [5163]. Atlanta [7266, 7208, 7501, 7176]. Atlantic [7080, 7087, 7069].
Audio [2921, 3881, 977]. Auditorium [7314]. AUGMENT [1264, 1097, 1106]. Augmented [5669, 729, 822, 6433, 6736].
Augmenting [2723, 2314]. August [7091, 7134, 7280, 7423, 7437, 7292, 7351, 7438, 7364, 7469, 7494, 7381, 7088, 7270, 7311, 7314, 7316, 7327, 7413, 7461, 7370, 7297, 7342, 7358, 7385, 7402, 7417, 7190, 7085, 7275, 7128, 7403, 7387, 7347, 7249, 7433, 4045].
Australian [7186]. Austria [7155]. Auswahl [1236]. Auswertungsalgorithmen [1061]. Author [4486, 4640, 5234, 5455, 6215, 6720, 6834, 772, 6579]. Auto [6501, 4184, 7041].
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Basel [7220, 2579]. Bases [5459, 6732, 6844, 548, 549, 549, 6128, 6141, 5277, 4562, 5604, 6083, 530, 597, 5129, 4029, 2222, 3797, 4740, 5624, 3176, 3355, 3953].

Basic [3546, 5793, 6352, 1266, 1500, 512, 6279, 4378, 633, 5027, 3635, 1146, 289, 6902, 2137, 1161, 5999, 5100, 1193, 5737, 755, 2809, 2996, 4916, 1085, 1010, 2582, 1336, 2594, 1091, 4499, 1727, 4457].

Basiserweiterung [3154]. Basiswahl [750, 751, 893].


BCD-based [5402]. BCD-floating-point [1788]. BDDs [5117].

Because [6479, 6493]. bedingte [547]. Bedot [6983].


Behavior [4947, 4336, 880, 5860, 6645, 6765, 879, 5983]. Behavioral [3877, 4296, 4005].


beliebig [2100]. beliebig [2051]. beliebiger [650]. Bell [2684, 75, 98, 571]. bench [3506].

Benchmark [6134, 1740, 1870, 1750, 1763, 1772, 1689, 4514, 1733, 1734, 1736, 3571]. Benchmarks [2670, 2232, 3029, 3613].

Benefit [6608, 1490]. Benefits [6743, 6744, 5040, 5176, 2486, 1483].

Benford [5254, 5563, 3704, 5659, 5660, 5677, 1096, 5266, 5493, 4836, 4995, 4535, 5151, 5024, 5166, 4223, 1445, 4420, 5429, 5761, 2279, 2280, 784, 716, 1470, 660].

Benutzerhandbuch [1468].

Berechnung [1811, 1094, 384, 2097, 585, 650, 1627, 1794]. beregnern [1328]. berekenen [491].

Berger [3629, 2423, 3121]. Bergman [4614]. Berichtigung [893, 357].

Berekeley [1378, 2106, 2244]. Berlin [7111, 7114, 7427, 7360].


Beschreibung [2609]. Besieged [5013].

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7431, 7447, 7274, 7154, 7142, 7128, 7476, 7374, 7467, 7335, 587, 7449, 7261,


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Convergent [2173, 3675, 3633]. convergents [5400]. Converging [3445, 2388, 3504].

Convergent [2173, 3675, 3633]. convergents [5400]. Converging [3445, 2388, 3504].

Convergent [2173, 3675, 3633]. convergents [5400]. Converging [3445, 2388, 3504].

Convergent [2173, 3675, 3633]. convergents [5400]. Converging [3445, 2388, 3504].

Convergent [2173, 3675, 3633]. convergents [5400]. Converging [3445, 2388, 3504].

Convergent [2173, 3675, 3633]. convergents [5400]. Converging [3445, 2388, 3504].

Convergent [2173, 3675, 3633]. convergents [5400]. Converging [3445, 2388, 3504].
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6862, 6863, 198, 224, 6133, 6244, 5261, 173, 3731, 5270, 501, 4526, 4861, 4988, 5275, 5395, 5491, 5492, 5580, 672, 674, 6146, 2525, 5396, 5900, 5500, 6045, 2531, 1405, 4843, 5902, 3747, 86, 5507, 1291, 1292, 1975, 3889, 5152, 5157, 5297, 5513, 1303, 2227, 4040, 5160, 5732, 1630, 4856, 5017, 5019, 260, 1144, 261.

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Eidetic

Eigensolvers

Eigenvalue

eigenvalues

Eigenvectors

Eighteenth

Eighth

Ein- 

Einbettung

einem

einfach

einfacher

Einige

Einiger

Einplatinenrechner

eins

Eisenstein

Eispack

elastic

electric

Electrical

d’Electrique

Electro

Electro/80

Electro/83

Electro/86

Electro/88

Electrologica

electromagnetic

Electronic

electronic

Electronics

Elf

elicited

Eliminate

Eliminating

Elimination

ELU

Elusive

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Error-Correcting [1613, 1144, 582]. Error-Detectable [2151]. Error-Detecting [1365].
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EXISTING [6645]. EXIT [3496]. EX-PAN [6797]. EXPANDED [1523].
EXPANDING [2716]. EXPANSION [1820, 6046, 6562, 2620, 976]. EXPANSIONS [548, 3868, 3995, 3996, 6164, 6548, 6183, 6103, 6104, 6577, 242, 6132, 5975, 146].
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EXPERIMENT [2066, 2618]. EXPERIMENTAL [327, 4494, 6854, 179, 6512, 590, 149, 1637, 7069, 339, 340].
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Floating


Floating

[6446, 3956, 1564, 5648, 6212, 3023, 3705, 3841, 4543, 5454, 6012, 6115, 6013, 720, 296, 1485, 2492, 2634, 3029, 3214, 3380, 3381, 3382, 3383, 4487, 6348, 6455, 6456, 6953, 2493, 1085, 1010, 5653, 1800, 2312, 1801, 1802, 1362, 2314, 1569, 1570, 2041, 2315, 4780, 6119, 4144, 1487, 2496, 2861, 3037, 5566, 5871, 2043, 1368, 1807, 2180, 2497, 2181, 5872, 4299, 2045, 2319, 6957, 2643, 3221, 3039, 2230, 4302, 5239, 5240, 1091, 2182, 1370, 2323, 5797, 4784, 2498, 1190, 5120, 3851, 2324, 6229, 2325, 2186, 2646, 2647, 3045, 1813, 4307, 4502, 4651, 4787, 4788, 4789.

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6106, 6590, 4120, 592, 3347, 6333, 6002, 7037, 5356, 2027, 848, 5548, 2822, 3518, 2824, 6706, 3350, 6334, 5857, 3829, 3193, 6208, 6442, 2299, 215, 1469, 1701, 2617, 5097, 5220, 5364, 5365, 5556, 5557, 5641, 1354, 2033, 3012, 216, 3201, 2302, 6210, 5223, 2625, 799, 3019, 1706, 5371, 4135, 6825, 6826, 6605, 5104, 5560, 5645, 5105, 5372, 5229, 6607, 5690, 5884, 4622, 6337, 4488, 6948, 4483, 2170, 2171, 416, 3215, 1947, 4296, 6464, 2326, 6961, 6962, 1578, 1579, 1718, 5249, 6471, 4794, 4968, 2503, 6360, 2666, 2667, 2668, 5375, 5454, 6115, 720, 1485, 2634, 3029, 3380, 3381, 3382, 4487, 6348, 6455, 2493, 1085, 5653]. Floating-point

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Quadratwurzel-Algorithmus

Quadratwurzelfunktion

Quadratlithon

Quadruple

quadruple-precision

Quality

Qualifying

Quality-Efficient

Quantitative

Quantizations

Quantized

Quantum

Quantum-Dot

quantum-dots

Quarter

Quartus

Quasi

Quasi-Pipelined

quasi-systolic

quasi-unity

Quasigroup

quaternion

quaternion-imaginary

Quaternion

Quaternions

Quibit

Que

Quebec

Query

Questions

Qui

Quick

Quickly

Quickhull

quirk

Quixilica

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Quotients

QuPAT

Quad-Double

Quadrant

Quadratic

Quadratic-like

Quadratic-Polynomial

Quadrature

Quadratwurzel

Quadratwurzelfunktion

Quadratlithon

Quadruple

quadruple-precision

Quality

Qualifying

Quality-Efficient

Quantitative

Quantizations

Quantized

Quantum

Quantum-Dot

quantum-dots

Quarter

Quartus

Quasi

Quasi-Pipelined

quasi-systolic

quasi-unity

Quasigroup

quaternion

quaternion-imaginary

Quaternion

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Qui

Quick

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quirk

Quixilica

Quotient

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Quotients

QuPAT

R

R.O.C.

r0p2

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R2000

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Rabat

racehorses

racetrack

Racine

racing

radar

Radian

Radical

Radici

Radio

Radisson

Radius

Radix

R2039

R565

R630

R680

R733

R2521

R2524

R2701

R5005

R7049

R1617

R1322

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1. Table 5 (page 124):
insert $k \leftarrow 0$ after assertion, and also delete $k \leftarrow 0$ from Table 6.

2. Table 9 (page 125):
   
   for $-1:$USER!"";
   substitute $-1:$USER!"0";
   and delete the comment.

3. Table 10 (page 125):
   
   for $\text{fill}(-k, "0")$
   substitute $\text{fill}(-k+1, "0")$

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• solution sets of linear systems,
• hardware and software systems for interval computations, and
• fuzzy logic.

Actual applications described in the book include:

• economic input-output models,
• quality control in manufacturing design,
• a computer-assisted proof in quantum mechanics,
• medical expert systems,
• and others.

A realistic view of interval computations is taken: the articles indicate when and how overestimation and other challenges can be overcome. An introductory chapter explains the content of the papers in terminology accessible to mathematically literate graduate students. The style of
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the individual, refereed contributions has been made uniform and understandable, and there is an extensive book-wide index. Audience: Valuable to students and researchers interested in automatic result verification. Detailed information, including contents, contributors, and an order form can be found:

- on Kluwer homepage http://www.kluwer.nl, or

The information on the Interval Computations homepage is basically a mirror image of the Kluwer one (the only difference is that the fonts are fancier).

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The main aim is to produce a usably efficient implementation, which can be easily interfaced with existing C++ code. This contrasts with previous implementations in functional languages (Haskell, Miranda etc.), which, although theoretically important, seem to be rather too slow for real use.

This code is designed as an add-on to Victor Shoup’s arbitrary-precision arithmetic package NTL, and implements a new type XR, to complement NTL’s ZZ and RR integer and real types.


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- branch and bound algorithms for global optimization,
- constraint propagation,
- solution sets of linear systems,
- hardware and software systems for interval computations, and
- fuzzy logic.

Actual applications described in the book include:

- economic input-output models,
- quality control in manufacturing design,
- a computer-assisted proof in quantum mechanics,
- medical expert systems,
- and others.

A realistic view of interval computations is taken: the articles indicate when and how overestimation and other challenges can be overcome. An introductory chapter explains the content of the papers in terminology accessible to mathematically literate graduate students. The style of
the individual, refereed contributions has been made uniform and understandable, and there is an extensive book-wide index. Audience: Valuable to students and researchers interested in automatic result verification. Detailed information, including contents, contributors, and an order form can be found:

- on Kluwer homepage http://www.wkap.nl, or

The information on the Interval Computations homepage is basically a mirror image of the Kluwer one (the only difference is that the fonts are fancier).


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