Errata for Discrete Fractional Calculus as of May 25, 2018:

CHAPTER 1

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(1) Page 17, line 16 "$+\frac{f(t)}{1-p(t)+q(t)}$"

(2) Page 24, line 13 replace "1.44" by "1.35"

(3) Page 24, line 15 replace second "cos" by "sin"

(4) Page 26, line 3- replace "$\cosh_p(t,a)$" by "$\cos_p(t,a)$"

(5) Page 26, line 2- replace "$\sinh_p(t,a)$" by "$\sin_p(t,a)$"

(6) Page 26, line 1- "$n > k \geq 0$"

(7) Page 28, line 6- "$c_3 = \frac{1}{2}$"

(8) Page 28, line 5- replace last "2" by "$\frac{1}{2}$"

(9) Page 28, line 1- replace second "d" by "d-1"

(10) Page 29, line 6- replace "b" by "b+1"

(11) Page 30, line 5- replace "derivative" by "difference"

(12) Page 41, line 7 replace "(1-t)" by "(t-1)"

(13) Page 44, line 1- replace first "t" by "t^2"

(14) Page 49, line 1

$$e_{\frac{\alpha}{t}}(t,a)\cos_{\frac{\beta}{1+\alpha}}(t,a), \quad e_{\frac{\alpha}{t}}(t,a)\sin_{\frac{\beta}{1+\alpha}}(t,a)$$

(15) Page 49, line 9- should be "$(t\Delta-\alpha_1)(t\Delta-\alpha_2)\cdots(t\Delta-\alpha_n)y=0$"

(16) Page 50, line 1 replace "$\mathbb{R}_n$" by "$\mathbb{R}^n$"

(17) Page 56, line 6 replace "i" by "k"

(18) Page 59, line 3- omit this line

(19) Page 65, line 15- replace "λ" by "λ_0"

(20) Page 68, line 8- replace "$(\sqrt{3})^t$" by "$c(\sqrt{3})^t$" Also replace "$(\sqrt{3})^{t+1}$" by "$c(\sqrt{3})^{t+1}$"

CHAPTER 2

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(1) Page 101, line 6 This formula is incorrect

(2) Page 102, line 6 should be "$= -\frac{\nu\Gamma(t-s)}{\Gamma(\nu+1)\Gamma(t-s-\nu+1)}$"

(3) Page 106, line 2- replace "$\mathbb{N}_0$" by "$\mathbb{N}_{\nu-N}$"

(4) Page 107, line 2 replace "$\mathbb{N}_0$" by "$\mathbb{N}_{\nu-N}$"

(5) Page 107, line 4 replace "$\mathbb{N}_0$" by "$\mathbb{N}_{\nu-N}$"

(6) Page 119, line 4 replace "$\Delta_a^{k+1} f(t)$" by "$\Delta_a^{-(k+1)} f(t)$"

(7) Page 119, line 7- replace "$h_{\nu-1}$" by "$h_{-\nu-1}$"

(8) Page 120, line 4 replace "$\Delta_a^{1+\nu} f(t)$" by "$\Delta_a^{\nu} f(t)$"

(9) Page 120, line 6- "$\int_a^t \Delta f(\tau)$" by "$\int_a^t \Delta f(\tau)\Delta\tau$"

(10) Page 121, line 8- replace "$f(t)$" by "$f(\tau)$"

(11) Page 121, line 6- $\int_a^{t-\nu+1} h_{\nu-2}(t, \sigma(\tau)) f(\tau)\Delta\tau$

(12) Page 122, line 2 $h_{\nu-k+j}(t, a)$

(13) Page 122, line 3 $\Delta_a^{k-\nu+1}(t, a)$

(14) Page 122, line 4 omit " $\Delta_a^{-\nu}$ "

(15) Page 136, line 5 replace "(2.38)" by "(2.39)"

(16) Page 141, line 8 "$a - N - \nu$"

CHAPTER 3

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(1) Page 152, line 12 The last sentence on this line should appear right after Definition 3.4

(2) Page 156, line 10- omit second ":"

(3) Page 158, line 5- replace lower limit to "t+1" and upper limit to "r"

(4) Page 160, line 5 and 6 it should be "$1 - p(\tau)$"

(5) Page 161, line 7 it should be "$\alpha \boxdot (\beta \boxdot p)$"

(6) Page 163, line 5- replace "g" by "q"

(7) Page 164, line 7 omit "where $t_0 \in \mathbb{N}_{a+1}$ and $A, B \in \mathbb{R}$"

(8) Page 173, line 12 $\int_a^t E_p(s, a)\nabla s = \frac{1}{p} E_p(s, a)|_a^t$

(9) Page 174, line 4- At the beginning of this line put an equal sign

(10) Page 174, line 2- replace "$\frac{1}{4}$" by "$\frac{3}{4}$"

(11) Page 177, line 4 lower limit of integration is a

(12) Page 177, line 7- replace "$\ominus 3$" by "$\boxminus 3$"

(13) Page 178, lines 12,13,14 replace"$\ominus 3$" by "$\boxminus 3$"

(14) Page 183, line 3- replace "$\mathbb{N}_0$" by "$\mathbb{N}_{a+1}$"

(15) Page 186, line 13- replace "(iii)" by "(iv)"

(16) Page 187, line 5- replace "$\rho(t)$" by "$\sigma(t)$"

(17) Page 187, line 4- need $f(\tau)$ in this sum

(18) Page 187, line 2- at the end of this line add "$+H_{\nu-1}(t,\rho(a))f(a)$"

(19) Page 189, line 15 need an "$f(\tau)$" under the integral sign

(20) Page 190, lines 1,6,8,9,10,4-,2- replace upper limit of sum by $N+m-1$

(21) Page 190, line 1 replace in two places "M" by "m"

(22) Page 190, lines 6, 7, 4-, 3- replace "M" by "m"

(23) Page 191, lines 1, 2 replace upper limit of sum by $N+m-1$

(24) Page 196, line 6- omit ",$|s|^p < 1$"

(25) Page 202, line 1 replace "a+1" by "a"

(26) Page 204, line 9, 15 replace "r" by "$\min\{1,r\}$"

(27) Page 204, line 11- omit "s^ν"

(28) Page 204, line 9- replace "1" by "$\min\{1,r\}$"

(29) Page 204 In Lemma 3.88 we assume $|s-1|<r$

(30) Page 205 In Theorem 3.89 we assume f is of exponential order $r>0$ and $|s-1| < min\{1,r\}$

(31) Page 207, line 10- replace "nonnegative" by "not negative"

(32) Page 208, line 9 the first "$-\nu$" should be "ν"

(33) Page 208, line 13 replace "3.89" by "3.90"

(34) Page 208, line 14 $RHS = s^\nu \mathcal{L}_{a+1}\{H_\mu(\cdot,a)\}(s)+\frac{s^\nu - s^{N-1}}{1-s}H_\mu(a+1,a)-\sum_{k=2}^{N} s^{N-k}\left[\nabla^{k-1}H_\nu(t,a)\right]_{t=a+1}$

(35) Page 208, line 15 should be $= s^\nu \mathcal{L}\{H_\mu(\cdot,a)\}(s) + \frac{s^\nu - s^{N-1}}{1-s} - \sum_{k=2}^{N} s^{N-k}$

(36) Page 209, line 2 should be (3.42)

(37) Page 209, line 8 replace "$h(t)$" by "$f(t)$"

(38) Page 209 lines 10,12,16 replace the lower limit "a" by "$a+1$"

(39) Page 209, line 10- replace "$f(a+)$" by "$f(a+N+1)$"

(40) Page 209, At the end of the proof of Theorem 3.94 add the following: Hence we see that the solution of the given IVP is uniquely determined at $t = a + N + 1$. In a similar manner if we let $t = a + N + 2$ in equation (3.43) we can show that the solution of the IVP is uniquely determined at $a + N + 2$. Using mathematical induction we obtain the desired result that the solution of the given IVP is uninguely determined on $\mathbb{N}_{a+1}$.

(41) Page 210, line 8- replace "$\rho(a)$" by "$\sigma(a)$"

(42) Page 210, line 7- replace "$\rho(a)$" by "$\sigma(a)$"

(43) Page 214, line 8 replace "$2k + 1$" by "$2k$"

(44) Page 215, In Theorem 3.103 we assume $\alpha k + \beta + 1$ is not a negative integer for $k = 0, 1, 2, \cdots$.

(45) Page 217, line 8- should be "$\nabla^{-\nu}_{\rho(a)} f(t)$"

(46) Page 220, line 7 "$H_{-\nu-1}(t, \rho(\tau))f(\tau)\nabla\tau$"

(47) Page 221, line 6- replace "(3.85)" by "Theorem 3.85"

(48) Page 222, line 9- need "$\nabla\tau$" at the end of this line

(49) Page 222, line 8- replace last term by $\int_{a+k}^{t} H_{\nu-2}(t, \rho(\tau))\nabla^{k-1} f(\tau)\nabla\tau$

(50) Page 222, line 7- replace this line by $= -\nabla^{k-1} f(a+k)H_{\nu-1}(t, a+k)+H_{\nu-2}(t, \tau)\nabla^{k-2} f(\tau)|_{a+k}^{t}+ \int_{a+k}^{t} H_{\nu-3}(t, \rho(\tau))\nabla^{k-2} f(\tau)\nabla\tau$

(51) Page 222, line 6- replace this line by $= -\nabla^{k-1} f(a + k)H_{\nu-1}(t, a + k) - H_{\nu-2}(t, a + k)\nabla^{k-2} f(a + k) + \int_{a+k}^{t} H_{\nu-3}(t, \rho(\tau))\nabla^{k-2} f(\tau)\nabla\tau$.

(52) Page 222, lines 5-, 4- omit these two lines

(53) Page 223, line 7, replace "$H_{N-\nu-k+j}(t, a)$" by "$\nabla^N H_{N-\nu-k+j}(t, a + k)$" note 2 changes

(54) Page 223, line 8 omit this line

(55) Page 223, line 9 replace last "a" by "a+k"

(56) Page 223, lines 2-,3- in both of these 2 lines replace "h" by"H"

(57) Page 224, line 8- in 2 places replace "h" by"H"

(58) Page 224, replace the end of this line by "the given IVP."

(59) Page 225, line 2, 3, 4-, 1- in each of these 4 lines replace "h" by"H"

(60) Page 225, line 4 replace "the equation." by "equation $\nabla^{\nu}_{a} x(t) = g(t)$" to get that

(61) Page 226, lines 2-4 in 5 places replace "h" by "H"

(62) Page 233, line 10 there is a missing parenthesis

(63) Page 234, line 14 need a minus sign in front of the summation

(64) Page 234, line 14 replace "$f(a+i-1)$" by "$f(a+i)$"

(65) Page 237, line 6- replace "$(-\mu+k+N-i)$" by "$(-\mu+k+N-i-1)$"

(66) Page 237, line 2- replace "$\rho(a)$" by "a"

(67) Page 237, line 1- replace first "a" by "$a+1$"

(68) Page 267, In Theorem 3.175 we assume $0<\nu<1$

(69) Page 268, line 1 replace "that" by for "$t \geq a+1$"

(70) Page 268, line 2 $RHS = \nabla[\nabla_{a*}^{\nu}\nabla_{a}^{-\nu}(1)](t+1)$

(71) Page 268, line 3 $RHS = \nabla[\nabla_{a}^{-(N-\nu)}\nabla^{N}\nabla_{a}^{-\nu}(1)](t+1)$

(72) Page 268, line 4 $RHS = [\nabla(1)](t+1)$

CHAPTER 4

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(1) Page 290, line 1- $(t-s)_{\overline{q}}^{\underline{n}}$

(2) Page 291, line 7- $D_q h_{n+1}(\alpha, t)$

(3) Page 292, line 13 replace every "α" that appears as an exponent including falling exponents that have an "α" in them by "ν"

(4) Page 292, line 14 replace second "α" by "ν"

(5) Page 293, thoughout this page replace every "α" that appears as an exponent including falling exponents that have an 'α" in them by "ν"

(6) Page 293, line 3 replace "$t \geq s$" by "$t \leq s$"

(7) Page 295, line 1 replace "q^{α}" by "q^{ν}"

(8) Page 307, line 12- replace "$f(t)$" by "$F(t)$"

(9) Page 337, line 1- replace "$[n]_p!$" by "$[n-1]_p!$"

(10) Page 339, line 2, 7- replace "$\alpha+1$" by "$\alpha-1$"

(11) Page 342, line 6- replace "q^k" by "q^i"

(12) Page 345, line 2 replace "$(p-1)$" by "$(1-p)$"

(13) Page 345, line 3 replace first minus sign with a plus sign

(14) Page 345, line 3 replace last plus sign with a minus sign

(15) Page 346, line 6 replace last "t" by "s"

CHAPTER 5

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(1)

CHAPTER 6

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(1)

CHAPTER 7

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