

Last updated 3/14//2019. Compiled by Ph.D. student Ms. Lihong Guo under the direction of Professor YangQuan Chen. If you find any book related to fractional calculus that should be included in this list, please send emails to: [yqchen@ieee.org](mailto:yqchen@ieee.org)

## List of AFC (applied fractional calculus) Related Books

### 2019

1. N. Su: [\*Fractional Calculus in Soil Hydrology and Mechanics: Fundamentals and Applications\*](#). CRC Press, 2019, 300pages, ISBN-10: 1138491667.
2. H. M. Srivastava: [\*Operators of Fractional Calculus and Their Applications\*](#). Mdpi AG, 2019, 136 pages, ISBN-10: 3038973408.
3. F. Colombo, J. Gantner: [\*Quaternionic Closed Operators, Fractional Powers and Fractional Diffusion Processes \(Operator Theory: Advances and Applications\)\*](#). Birkhäuser, 2019, ISBN-10: 303016408X.
4. A. I. Saichev: [\*Distributions in the Physical and Engineering Sciences, Volume 3: Random and Anomalous Fractional Dynamics in Continuous Media\*](#). Birkhäuser, 2019, 424 pages, ISBN-10: 3030064670.
5. X. J. Yang: [\*General Fractional Derivatives: Theory, Methods and Applications\*](#). Chapman and Hall/CRC, 2019, 384 pages, ISBN-10: 1138336165.
6. X. J. Yang, F. Gao, J. Yang: [\*General Fractional Derivatives with Applications in Viscoelasticity\*](#). Academic Press, 2019, 395 pages, ISBN-10: 0128172088.
7. W. Chen, Y. Li, P. Ma: [\*The Fractional Laplacian\*](#). World Scientific Pub Co Inc. 2019, 350 pages, ISBN-10: 9813223995.
8. O. Banna, Y. Mishura, K. Ralchenko: [\*Fractional Brownian Motion \(Approximations of fBm\): Weak and Strong Approximations and Projections\*](#). Wiley-ISTE, 2019, ISBN-10: 1786302608.
9. T. Michelitsch, B. Colle, A. P. Riascos: [\*Fractional Dynamics on Lattices and Networks\*](#). Wiley-ISTE, 2019, 200 pages, ISBN-10: 178630158X.
10. Y. Liang, W. Chen, W. Cai: [\*Hausdorff Calculus: Applications to Fractal Systems \(Fractional Calculus in Applied Sciences and Engineering\)\*](#). De Gruyter, 2019, 310 pages, ISBN-10: 3110606925.
11. A. Kochubei, Y. Luchko: [\*Fractional Differential Equations \(De Gruyter Reference\)\*](#). De Gruyter, 2019, 601 pages, ISBN-10: 3110570823.
12. J. F. Gómez, L. Torres, R. F. Escobar: [\*Fractional Derivatives with Mittag-Leffler Kernel: Trends and Applications in Science and Engineering\*](#). Springer. 2019. 341 pages, ISBN-10: 3030116611.
13. A. M. Mathai, H. J. Haubold: [\*An Introduction to Fractional Calculus \(Mathematics Research Developments\)\*](#). Nova Science Pub Inc. 2019, 258 pages, ISBN-10: 1536146323. (Hardcopy@MESA Lab)
14. H. M. Srivastava. [\*Operators of Fractional Calculus and Their Applications\*](#). Mdpi AG, 2019, 136 pages, ISBN-10: 3038973408.
15. C. Milici, G. Drăgănescu, J. T. Machado: [\*Introduction to fractional differential equations \(Nonlinear Systems and Complexity\)\*](#). Springer, 2019, 188 pages, ISBN-10: 3030008940.

## 2018

16. F. Ge, Y. Chen, C. Kou: [Regional analysis of time-fractional diffusion processes](#). Springer International Publishing, 2018, 250 pages, ISBN-10: 9783319728957.(Hardcopy@MESA Lab)
17. K. Cao, Y. Chen: [Fractional Order Crowd Dynamics: Cyber-Human System Modeling and Control](#). Vol. 4. Walter de Gruyter GmbH & Co KG, 2018, 138 pages, ISBN-13: 9783110472813. (Hardcopy@MESA Lab)
18. G. A. Anastassiou: [Nonlinearity: Ordinary and Fractional Approximations by Sublinear and Max-Product Operators](#). Springer, 2018, 293 pages, ISBN-10: 3319895087.
19. A. Amenta, P. Auscher: [Elliptic Boundary Value Problems with Fractional Regularity Data: The First Order Approach](#). American Mathematical Soc., 2018, 152pages, ISBN-10: 1470442507.
20. H. J. Hans: [Special Functions: Fractional Calculus and the Pathway for Entropy](#). MDPI, 2018, 304pages, ISBN-10: 3038426652.
21. M. Edelman, E. N. Macau, M. Sanjuan: [Chaotic, Fractional, and Complex Dynamics: New Insights and Perspectives](#). Springer, 2018, 315 pages, ISBN-10: 3319681087.
22. S. Bhalekar: [Frontiers in Fractional Calculus \(Current Developments in Mathematical Sciences\)](#), Bentham Science Publishers, 2018, 375pages, ISBN-10: 168108600X.
23. C. F. Lorenzo, T. Hartley: [Generalized Functions for the Fractional Calculus](#). Independently published, 1999 (2018 Publish), 36pages, ISBN-10: 1724034332.
24. L. R. Evangelista, E. K. Lenzi: [Fractional diffusion equations and anomalous diffusion](#). Cambridge University Press, 2018, 358 pages, ISBN-10: 9781107143555.
25. R. Martínez-Guerra, C. A. Pérez-Pinacho: [Advances in Synchronization of Coupled Fractional Order Systems: Fundamentals and Methods](#). Springer, 2018, 185pages, ISBN-10: 3319939459, ISBN-13: 978-3319939452.
26. V. Vyawahare, P. V. Nataraj: [Fractional-order Modeling of Nuclear Reactor: From Subdiffusive Neutron Transport to Control-oriented Models: A Systematic Approach](#). Springer, 2018, 200pages, ISBN-10: 9811356556.
27. C. Skiadas: [Fractional Dynamics, Anomalous Transport and Plasma Science: Lectures from CHAOS2017](#). Springer, 2018, 201 pages, ISBN-10: 3030044823.
28. G. A. Anastassiou: [Ordinary and Fractional Approximation by Non-additive Integrals: Choquet, Shilkret and Sugeno Integral Approximators](#). Springer, 2018, 347 pages, ISBN-10:

3030042863.

29. G. A. Anastassiou, I. K. Argyros: [\*Functional Numerical Methods: Applications to Abstract Fractional Calculus\*](#). Springer, 2018, 161 pages, ISBN-10: 3319887947.
30. S. G. Georgiev: [\*Fractional dynamic calculus and fractional dynamic equations on time scales\*](#). Springer, 2018, 360 pages, ISBN-10: 9783319739533.
31. J. Dix: [\*Fractional Calculus, Paths on Networks, Geometry, Gravitation: Collected Essays, Volume I\*](#). Independently published, 2018, 109 pages, ISBN-10: 1719825270.

## 2017

32. A. T. Azar, S. Vaidyanathan, A. Ouannas: [\*Fractional order control and synchronization of chaotic systems\*](#). Springer, 2017, 877 pages, ISBN-10: 3319502484.
33. R. U. Verma: [\*Semi-Infinite Fractional Programming\*](#). Springer Singapore, 2017, 291pages, ISBN-10: 9811062552.
34. M. Chen, S. Shao, P. Shi: [\*Robust adaptive control for fractional-order systems with disturbance and saturation\*](#). John Wiley & Sons, 2017, 256 pages, ISBN-10: 1119393272.
35. M. Fečkan, J. Wang, M. Pospíšil: [\*Fractional-order equations and inclusions\*](#). Walter de Gruyter GmbH & Co KG, 2017, 367 pages, ISBN-10: 3110521385, ISBN-13: 9783110521382.
36. M. Chen, S. Shao, P. Shi: [\*Robust adaptive control for fractional-order systems with disturbance and saturation\*](#). Wiley-ASME Press Series, 2017, 256 pages, ISBN-10: 1119393272.
37. B. J. West: [\*Nature's Patterns and the Fractional Calculus\*](#). Walter de Gruyter GmbH & Co KG, 2017, 199pages, ISBN-10: 3110534118. (Hardcopy@MESA Lab)
38. A. M. Mathai, H. J. Haubold: [\*Fractional and multivariable calculus: model building and optimization problems\*](#). Springer, 2017, 234 pages, ISBN-10: 3319599925.
39. I. M. Stamova, G. T. Stamov: [\*Functional and impulsive differential equations of fractional order: qualitative analysis and applications\*](#). CRC Press, 2017, 276 pages, ISBN-10: 1498764835.
40. K. Kubilius, Y. Mishura, K. Ralchenko: [\*Parameter estimation in fractional diffusion models\*](#). Springer, 2017, 390pages, ISBN-10: 331971029X.
41. D. Xue: [\*Fractional-order control systems: fundamentals and numerical implementations\*](#). Vol. 1. Walter de Gruyter GmbH & Co KG, 2017, 320 pages, ISBN-10: 3110499991.

## 2016

42. C. Pozrikidis: [\*The Fractional Laplacian\*](#). Chapman and Hall/CRC, 2016, 294pages, ISBN-10: 1498746152.
43. C. F. Lorenzo, T. T. Hartley: [\*The fractional trigonometry: With applications to fractional differential equations and science\*](#). John Wiley & Sons, 2016, 464 pages, ISBN-10: 9781119139409.
44. S. Chakraverty, S. Tapaswini, D. Behera: [\*Fuzzy Arbitrary Order System: Fuzzy Fractional Differential Equations and Applications\*](#). John Wiley & Sons, 2016, 272 pages, ISBN-10:

111900411X.

45. G. A. Anastassiou, I. K. Argyros: [\*Intelligent Numerical Methods II: Applications to Multivariate Fractional Calculus\*](#). Springer International Publishing, 2016, 116 pages, ISBN-10: 3319336053.

## 2015

46. C. Li, F. Zeng: [\*Numerical methods for fractional calculus\*](#). Chapman and Hall/CRC, 2015, 300 pages, ISBN-10: 1482253801.
47. R. Martínez-Guerra, C. A. Pérez-Pinacho, G. C. Gómez-Cortés: [\*Synchronization of integral and fractional order chaotic systems: A differential algebraic and differential geometric approach\*](#). Springer, 2015, 242 pages, ISBN-10: 3319152831.
48. Y. Povstenko: [\*Fractional thermoelasticity \(Solid Mechanics and Its Applications\)\*](#). Springer, 2015, 253 pages, ISBN-10: 331915334X.
49. A. B. Malinowska, T. Odziejewicz, F. M. Torres: [\*Advanced methods in the fractional calculus of variations\*](#). Springer, 2015, 148 pages, ISBN-10: 9783319147550.
50. T. Kaczorek, K. Rogowski: [\*Fractional linear systems and electrical circuits \(Studies in Systems, Decision and Control\)\*](#). Cham, Switzerland: Springer International Publishing, 2015, 254 pages, ISBN-10: 3319113607.
51. F. Padula, A. Visioli: [\*Advances in robust fractional control\*](#). Cham, Switzerland: Springer, 2015, 176 pages, ISBN-10: 3319109294.
52. B. Bandyopadhyay, S. Kamal: [\*Stabilization and control of fractional order systems: a sliding mode approach\*](#). Vol. 317. Switzerland: Springer International Publishing, 2015, 200 pages, ISBN-10: 3319086200.

## 2014

53. T. M. Atanackovic: [\*Fractional calculus with applications in mechanics: vibrations and diffusion processes\*](#). John Wiley & Sons, 2014, 336 pages, ISBN-10: 9781848214170.
54. R. Herrmann: [\*Fractional calculus: an introduction for physicists\(2nd Edition\)\*](#). World Scientific, 2014, 500 pages, ISBN-10: 9814551074.

## 2013

55. S. Cohen, J. Istaş: [\*Fractional fields and applications\*](#). Heidelberg: Springer, 2013, 284 pages, ISBN-10: 3642367380.
56. V. Daftardar-Gejji: [\*Fractional Calculus: Theory and Applications\*](#). Narosa, New Delhi, 2013, 232 pages, ISBN-10: 8184873336. (Hardcopy@MESA Lab)

## 2012

57. I. Nourdin: [\*Selected aspects of fractional Brownian motion\*](#). Milan: Springer, 2012, 122 pages, ISBN-10: 8847028221.
58. Y. Luo, Y. Chen: [\*Fractional order motion controls\*](#). John Wiley & Sons, 2012, 454 pages, ISBN-10: 1119944554.
59. M. H. Annaby, Z. S. Mansour: [\*Q-fractional Calculus and Equations\*](#). Springer, 2012, 340 pages, ISBN-10: 364230897X.
60. I. Pan, S. Das: [\*Intelligent fractional order systems and control: an introduction\*](#). Springer, 2012, 316 pages, ISBN-10: 3642438520.
61. S. Abbas, M. Benchohra, G. M. N'Guérékata: [\*Topics in fractional differential equations\*](#). Springer Science & Business Media, 2012, 412 pages, ISBN-10: 1489995471.
62. M. Zubair, M. J. Mughal, Q. A. Naqvi: [\*Electromagnetic fields and waves in fractional dimensional space\*](#). Springer Science & Business Media, 2012, 88 pages, ISBN-10: 3642253571.
63. J. Klafter, S. C. Lim, R. Metzler: [\*Fractional dynamics: recent advances\*](#). World Scientific, 2012, 530 pages.
64. D. Baleanu, K. Diethelm, E. Scalas, J. J. Trujillo: [\*Fractional calculus: models and numerical methods\*](#). World Scientific, 2012, 478 pages, ISBN-10: 9813140038.

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65. M. M. Meerschaert, A. Sikorskii: [\*Stochastic models for fractional calculus\*](#). Walter de Gruyter, 2011, 391 pages, ISBN-10: 3110258692, ISBN-13: 978-3-11-025869-1.
66. D. Baleanu, J. A. Machado, A. Luo: [\*Fractional dynamics and control\*](#). Springer Science & Business Media, 2011, 320 pages, ISBN-10: 1489992529.
67. H. Sheng, Y. Chen, T. Qiu: [\*Fractional processes and fractional-order signal processing: techniques and applications\*](#). Springer Science & Business Media, 2011, 295 pages, ISBN-10: 1447122321.
68. S. Das, I. Pan: [\*Fractional order signal processing: introductory concepts and applications\*](#). Springer Science & Business Media, 2011, 116 pages, ISBN-10: 3642231160.
69. S. Das: [\*Functional fractional calculus\*](#). Springer Science & Business Media, 2011, 612 pages, ISBN-10: 3642205445.
70. B. L. S. Prakasa Rao: [\*Statistical inference for fractional diffusion processes\*](#). John Wiley & Sons, 2011, 280 pages, ISBN-10: 0470665688.
71. M. D. Ortigueira: [\*Fractional calculus for scientists and engineers\*](#). Springer Science & Business Media, 2011, 154 pages, ISBN-10: 9789400707467.
72. I. Petráš: [\*Fractional-order nonlinear systems: modeling, analysis and simulation\*](#). Springer Science & Business Media, 2011, 218 pages, ISBN-10: 9783642181009.
73. T. Kaczorek: [\*Selected problems of fractional systems theory\*](#). Springer Science & Business Media, 2011, 364 pages, ISBN-10: 3642205011.
74. V. E. Tarasov: [\*Fractional dynamics: applications of fractional calculus to dynamics of particles, fields and media\*](#). Springer Science & Business Media, 2011, 505 pages, ISBN-10:

3642140025.

75. A.C. J. Luo, V. Afraimovich: [\*Long-range Interactions, Stochasticity and Fractional Dynamics: Dedicated to George M. Zaslavsky \(1935—2008\)\*](#). Springer Science & Business Media, 2011, 311 pages, ISBN-10: 3642123422.
76. E. R. Scheinerman, D. H. Ullman: [\*Fractional graph theory: a rational approach to the theory of graphs\*](#). Dover Publications, 2011, 240 pages, ISBN-10: 0486485935.
77. J. S. Leszczyński: [\*An introduction to fractional mechanics\*](#). Publishing Office of Czestochowa University of Technology, 2011, 128pages, ISBN: 978-83-7193-494-0.(Hardcopy@MESA Lab)

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78. C. A. Monje, Y. Chen, B. M. Vinagre, et al.: [\*Fractional-order systems and controls: fundamentals and applications\*](#)[M]. Springer Science & Business Media, 2010, 415 pages, ISBN-10: 1849963347.
79. K. Diethelm: [\*The analysis of fractional differential equations: An application-oriented exposition using differential operators of Caputo type\*](#). Springer Science & Business Media, 2010, 264 pages, ISBN-10: 9783642145735.
80. F. Mainardi: [\*Fractional calculus and waves in linear viscoelasticity: an introduction to mathematical models\*](#). Imperial College Pr, 2010, 347 pages, ISBN-10: 1848163290.
81. R. Caponetto, G. Dongola, L. Fortuna, I. Petras: [\*Fractional order systems: modeling and control applications\*](#). Vol. 72. World Scientific, 2010, 200 pages, ISBN-10: 9814304190. (Hardcopy@MESA Lab)
82. D. Baleanu, Z. B. Güvenç, J. A. Tenreiro Machado: [\*New trends in nanotechnology and fractional calculus applications\*](#). New York: Springer, 2010, 531 pages, ISBN-10: 9048132924.(Hardcopy@MESA Lab)

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83. S. Rostek: [\*Option Pricing in Fractional Brownian Markets \(Lecture Notes in Economics and Mathematical Systems\)\*](#). Springer, 2009, 152 pages, ISBN-10: 3642003303.
84. M. Klimek: [\*On Solutions of Linear Fractional Differential Equations of a Variational Type.\*](#), Publishing Office of Czestochowa University of Technology, 2009, 244 pages, ISBN-10: 837193422X.

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87. S. Das: [\*Functional Fractional Calculus for System Identification and Controls\*](#). Springer, 2008, 260 pages, ISBN-10: 3642091784.

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89. A. A. Kilbas, H. M. Srivastava, J. J. Trujillo: [\*Theory and applications of fractional differential equations\*](#). Vol. 204. Elsevier Science Limited, 2006, 540 pages, ISBN-10: 0444518320.
90. R. L. Magin: [\*Fractional calculus in bioengineering\*](#). Redding: Begell House, 2006, 684 pages, ISBN-10: 1567002153.

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92. A. Khare: [\*Fractional statistics and quantum theory\*](#). World Scientific, 2005, 316 pages, ISBN-10: 9812561609.
93. G. M. Zaslavsky: [\*Hamiltonian chaos and fractional dynamics\*](#). Oxford University Press on Demand, 2005, 436 pages, ISBN-10: 0199535485.

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94. A. M. F. Ohashi: [\*Evolution equations driven by a fractional white noise in spaces of abstract stochastic distributions\*](#). UNICAMP, 2004,

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95. E. B. Bajalinov: [\*Linear-fractional programming theory, methods, applications and software\*](#). Vol. 84. Springer Science & Business Media, 2003, 425 pages, ISBN-10: 1461348226.

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96. R. Hilfer: [\*Applications of fractional calculus in physics\*](#). World Scientific, 2000, 472 pages, ISBN-10: 9810234570.

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97. I. Podlubny: [\*Fractional differential equations: an introduction to fractional derivatives, fractional differential equations, to methods of their solution and some of their applications\*](#). Academic Press, 1998, 340 pages, ISBN-10: 0125588402.

98. A. I. Barros: [\*Discrete and fractional programming techniques for location models\*](#). Springer Science & Business Media, 1998, 180 pages, ISBN-10: 1461368243.

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99. N. K. Blied: [\*Generalized analytic functions in fractional spaces\*](#). Vol. 86. CRC Press, 1997, 160 pages, ISBN-10: 0582288614.
100. I. V. Novozhilov: [\*Fractional analysis: Methods of motion decomposition\*](#). Springer Science & Business Media, 1997, 232 pages, ISBN-10: 1461286670.
101. A. Carpinteri, F. Mainardi: [\*Fractals and fractional calculus in continuum mechanics\*](#). Vol. 378. Springer, 1997, 348 pages, ISBN-10: 321182913X.

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102. B. Rubin: [\*Fractional integrals and potentials\*](#). Chapman and Hall/CRC, 1996, 424 pages, ISBN-10: 0582253411.
103. T. Runst, W. Sickel: [\*Sobolev spaces of fractional order, Nemytskij operators, and nonlinear partial differential equations\*](#). Walter de Gruyter, 1996, 560 pages, ISBN: 3-11-015113-8.

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104. T. Chakraborty, P. Pietiläinen: [\*The quantum Hall effects: integral and fractional\*](#). Vol. 85. Springer Science & Business Media, 1995, 302 pages, ISBN-10: 354058515X.

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105. V. S. Kiryakova: [\*Generalized fractional calculus and applications\*](#). CRC press, 1993, 360 pages, ISBN-10: 0582219779.
106. K. S. Miller, B. Ross: [\*An introduction to the fractional calculus and fractional differential equations\*](#). Wiley-Interscience, 1993, 384 pages, ISBN-10: 0471588849.
107. S. G. Samko, A. A. Kilbas, O. I. Marichev: [\*Fractional Integrals and Derivatives: Theory and Applications\*](#). Gordon and Breach, 1993, 1006 pages, ISBN 2881248640.

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108. F. Wilczek: [\*Fractional statistics and anyon superconductivity\*](#). World scientific, 1990, 460 pages, ISBN-10: 9810200498.

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109. K. B. Oldham, J. Spanier: [\*The fractional calculus theory and applications of differentiation\*](#)

*and integration to arbitrary order.* Dover Publications, 1974, 234 pages, ISBN-10: 0486450015.