Bibliography

- [1] D. A. Nield, A. Bejan, et al., Convection in porous media, vol. 3. Springer, 2006.
- [2] R. Woltmann, Contributions to hydraulic architecture, vol. 3. Johann Christian Dieterich, 1794.
- [3] A. Delesse, "Procédé mécanique pour déterminer la composition des roches," Ann Min, vol. 13, pp. 379–388, 1848.
- [4] A. Fick, "Ueber diffusion," Annalen der Physik, vol. 170, no. 1, pp. 59-86, 1855.
- [5] J. Stefan, "Über das gleichgewicht und die bewegung, insbesondere die diffusion von gasgemengen," Sitzber. Akad. Wiss. Wien, vol. 63, pp. 63–124, 1871.
- [6] H. Darcy, Les fontaines publiques de la ville de Dijon: exposition et application... Victor Dalmont, 1856.
- [7] G. Jaumann, "Geschlossenes system physicalisher und chemischer differentialgesetze," Sitzber. Akad. Wiss. Wien (IIa), vol. 120, pp. 385–530, 1911.
- [8] P. Fillunger, "Der auftrieb in talsperren. osterr. wochenschrift fur den offent!. baudienst," 1913.
- [9] G. Heinrich, "Wissenschaftliche grundlagen der theorie der setzung von tonschichten," Wasserkraft und Wasserwirtschaft, vol. 33, no. 5, p. 10, 1938.
- [10] M. A. Biot, "Le problem de la consolidation des matieres argileuses sous une charge," Annaies de la Societe Scientifique de Bruxelles, pp. 110–113, 1935.
- M. A. Biot, "General theory of three-dimensional consolidation," Journal of applied physics, vol. 12, no. 2, pp. 155–164, 1941.
- [12] M. A. Biot, "Theory of elasticity and consolidation for a porous anisotropic solid," *Journal of applied physics*, vol. 26, no. 2, pp. 182–185, 1955.

- [13] M. A. Biot, "General solutions of the equations of elasticity and consolidation for a porous material," J. appl. Mech, vol. 23, no. 1, pp. 91–96, 1956.
- [14] M. A. Biot, "Theory of propagation of elastic waves in a fluid-saturated porous solid.
 ii. higher frequency range," *The Journal of the acoustical Society of america*, vol. 28, no. 2, pp. 179–191, 1956.
- [15] R. De Boer and W. Ehlers, "A historical review of the formulation of porous media theories," Acta Mechanica, vol. 74, no. 1, pp. 1–8, 1988.
- [16] G. v. Heinrich and K. Desoyer, "Theorie dreidimensionaler setzungsvorgänge in tonschichten," *Ingenieur-Archiv*, vol. 30, no. 4, pp. 225–253, 1961.
- [17] C. Truesdell, "Sulle basi della termodinamica delle miscele," Rend. Lincei, vol. 44, no. 8, pp. 381–383, 1968.
- [18] C. Truesdell, "Sulle basi della termomeccanica," Rend. Lincei, vol. 22, no. 8, pp. 33– 38, 1957.
- [19] P. D. Kelly, "A reacting continuum," International Journal of Engineering Science, vol. 2, no. 2, pp. 129–153, 1964.
- [20] J. E. Adkins, "Non-linear diffusion-non-linear diffusion i. diffusion and flow of mixtures of fluids," *Philosophical Transactions of the Royal Society of London. Series* A, Mathematical and Physical Sciences, vol. 255, no. 1064, pp. 607–633, 1963.
- [21] J. Adkins, "Non-linear diffusion-non-linear diffusion ii. constitutive equations for mixtures of isotropic fluids," *Philosophical Transactions of the Royal Society of Lon*don. Series A, Mathematical and Physical Sciences, vol. 255, no. 1064, pp. 635–650, 1963.
- [22] J. Adkins, "Diffusion of fluids through aeolotropic highly elastic solids," Archive for Rational Mechanics and Analysis, vol. 15, no. 3, pp. 222–234, 1964.
- [23] A. Green and J. Adkins, "A contribution to the theory of non-linear diffusion," Archive for rational mechanics and analysis, vol. 15, no. 3, pp. 235–246, 1964.
- [24] R. M. Bowen, "Toward a thermodynamics and mechanics of mixtures," Archive for Rational Mechanics and Analysis, vol. 24, no. 5, pp. 370–403, 1967.
- [25] R. M. Bowen and J. Wiese, "Diffusion in mixtures of elastic materials," International Journal of Engineering Science, vol. 7, no. 7, pp. 689–722, 1969.

- [26] R. M. Bowen, "Incompressible porous media models by use of the theory of mixtures," *International Journal of Engineering Science*, vol. 18, no. 9, pp. 1129–1148, 1980.
- [27] R. M. Bowen, "Compressible porous media models by use of the theory of mixtures," International Journal of Engineering Science, vol. 20, no. 6, pp. 697–735, 1982.
- [28] R. Bowen, "Theory of mixtures, vol. iii," 1976.
- [29] W. Ehlers, "On thermodynamics of elasto-plastic porous media," Arch. Mech, vol. 41, no. 1, pp. 73–93, 1989.
- [30] B. Ross, Fractional calculus and its applications: proceedings of the international conference held at the University of New Haven, June 1974, vol. 457. Springer, 2006.
- [31] N. Y. Sonin, "On differentiation with arbitrary index," Moscow Matem. Sbornik, vol. 6, no. 1, pp. 1–38, 1869.
- [32] A. Letnikov, "Theory of differentiation with an arbtraly indicator," *Matem Sbornik*, vol. 3, pp. 1–68, 1868.
- [33] H. Laurent, "Sur le calcul des dérivées à indices quelconques," Nouvelles annales de mathématiques: journal des candidats aux écoles polytechnique et normale, vol. 3, pp. 240–252, 1884.
- [34] A. Grunwald, "Uber" begrente" derivationen und deren anwedung," Zangew Math und Phys, vol. 12, pp. 441–480, 1867.
- [35] M. Riesz, "Riemann-liouville general int 'e and invariant solution of the cauchy problem for the é equation of probes," in *Proceedings of the International Congress* of Mathematicians, vol. 2, pp. 44–45, 1936.
- [36] K. Oldham and J. Spanier, The fractional calculus theory and applications of differentiation and integration to arbitrary order. Elsevier, 1974.
- [37] K. Nishimoto, An Essence of Nishimoto's Fractional Calculus (Calculus in the 21st Century): Integrations and Differentiations of Arbitrary Order. Descartes Press Company, 1991.
- [38] K. S. Miller and B. Ross, An introduction to the fractional calculus and fractional differential equations. Wiley, 1993.

- [39] V. Kiryakova, "Generalized fractional calculus and applications, pitman res notes math 301, longman scientific & technical: Harlow," 1994.
- [40] B. Rubin, Fractional integrals and potentials, vol. 82. CRC Press, 1996.
- [41] I. Podlubny, Fractional differential equations: an introduction to fractional derivatives, fractional differential equations, to methods of their solution and some of their applications, vol. 198. Elsevier, 1998.
- [42] H. Rudolf, Applications of fractional calculus in physics. world scientific, 2000.
- [43] A. A. A. Kilbas, H. M. Srivastava, and J. J. Trujillo, Theory and applications of fractional differential equations, vol. 204. Elsevier Science Limited, 2006.
- [44] S. Falcon and Á. Plaza, "On k-fibonacci sequences and polynomials and their derivatives," *Chaos, Solitons & Fractals*, vol. 39, no. 3, pp. 1005–1019, 2009.
- [45] P. F. Byrd, "16 expansion of analytic functions in polynomials associated with fibonacci numbers," *The Fibonacci Quarterly*, vol. 1, p. 16, 1963.
- [46] B. Baeumer, D. A. Benson, M. M. Meerschaert, and S. W. Wheatcraft, "Subordinated advection-dispersion equation for contaminant transport," *Water Resources Research*, vol. 37, no. 6, pp. 1543–1550, 2001.
- [47] R. Gorenflo, F. Mainardi, D. Moretti, G. Pagnini, and P. Paradisi, "Discrete random walk models for space-time fractional diffusion," *Chemical physics*, vol. 284, no. 1-2, pp. 521–541, 2002.
- [48] A. Cartea and D. del Castillo-Negrete, "Fractional diffusion models of option prices in markets with jumps," *Physica A: Statistical Mechanics and its Applications*, vol. 374, no. 2, pp. 749–763, 2007.
- [49] R. L. Magin, C. Ingo, L. Colon-Perez, W. Triplett, and T. H. Mareci, "Characterization of anomalous diffusion in porous biological tissues using fractional order derivatives and entropy," *Microporous and Mesoporous Materials*, vol. 178, pp. 39– 43, 2013.
- [50] B. Henry, T. Langlands, and S. Wearne, "Fractional cable models for spiny neuronal dendrites," *Physical review letters*, vol. 100, no. 12, p. 128103, 2008.
- [51] O. S. Iyiola and F. Zaman, "A fractional diffusion equation model for cancer tumor," *AIP Advances*, vol. 4, no. 10, p. 107121, 2014.

- [52] Z. Korpinar, M. Inc, E. Hınçal, and D. Baleanu, "Residual power series algorithm for fractional cancer tumor models," *Alexandria Engineering Journal*, vol. 59, no. 3, pp. 1405–1412, 2020.
- [53] N. Ahmed, N. A. Shah, S. Taherifar, and F. Zaman, "Memory effects and of the killing rate on the tumor cells concentration for a one-dimensional cancer model," *Chaos, Solitons & Fractals*, vol. 144, p. 110750, 2021.
- [54] H. Namazi, V. V. Kulish, and A. Wong, "Mathematical modelling and prediction of the effect of chemotherapy on cancer cells," *Scientific reports*, vol. 5, no. 1, pp. 1–8, 2015.
- [55] S. Bunimovich-Mendrazitsky, E. Shochat, and L. Stone, "Mathematical model of bcg immunotherapy in superficial bladder cancer," *Bulletin of Mathematical Biology*, vol. 69, no. 6, pp. 1847–1870, 2007.
- [56] H. Wang and T. S. Basu, "A fast finite difference method for two-dimensional spacefractional diffusion equations," *SIAM Journal on Scientific Computing*, vol. 34, no. 5, pp. A2444–A2458, 2012.
- [57] E. Hanert and C. Piret, "A chebyshev pseudospectral method to solve the space-time tempered fractional diffusion equation," *SIAM Journal on Scientific Computing*, vol. 36, no. 4, pp. A1797–A1812, 2014.
- [58] A. Cheng, H. Wang, and K. Wang, "A eulerian-lagrangian control volume method for solute transport with anomalous diffusion," *Numerical Methods for Partial Differential Equations*, vol. 31, no. 1, pp. 253–267, 2015.
- [59] X. Li and B. Wu, "A numerical method for solving distributed order diffusion equations," Applied Mathematics Letters, vol. 53, pp. 92–99, 2016.
- [60] S. Wei, W. Chen, Y. Zhang, H. Wei, and R. M. Garrard, "A local radial basis function collocation method to solve the variable-order time fractional diffusion equation in a two-dimensional irregular domain," *Numerical Methods for Partial Differential Equations*, vol. 34, no. 4, pp. 1209–1223, 2018.
- [61] M. A. Zaky and J. T. Machado, "Multi-dimensional spectral tau methods for distributed-order fractional diffusion equations," *Computers & Mathematics with Applications*, vol. 79, no. 2, pp. 476–488, 2020.

- [62] P. Verma and M. Kumar, "Exact solution with existence and uniqueness conditions for multi-dimensional time-space tempered fractional diffusion-wave equation," *Engineering with Computers*, pp. 1–11, 2020.
- [63] X. Jiang, M. Xu, and H. Qi, "The fractional diffusion model with an absorption term and modified fick's law for non-local transport processes," *Nonlinear Analysis: Real World Applications*, vol. 11, no. 1, pp. 262–269, 2010.
- [64] H. Jiang, Y. Cheng, L. Yuan, F. An, and K. Jin, "A fractal theory based fractional diffusion model used for the fast desorption process of methane in coal," *Chaos: An Interdisciplinary Journal of Nonlinear Science*, vol. 23, no. 3, p. 033111, 2013.
- [65] A. D. Obembe, M. E. Hossain, and S. A. Abu-Khamsin, "Variable-order derivative time fractional diffusion model for heterogeneous porous media," *Journal of Petroleum Science and Engineering*, vol. 152, pp. 391–405, 2017.
- [66] D. Gu, D. Ding, Z. Gao, L. Tian, L. Liu, and C. Xiao, "A fractally fractional diffusion model of composite dual-porosity for multiple fractured horizontal wells with stimulated reservoir volume in tight gas reservoirs," *Journal of Petroleum Science* and Engineering, vol. 173, pp. 53–68, 2019.
- [67] Y. Bai, L. Huo, Y. Zhang, J. Liu, H. Shao, C. Wu, and Z. Guo, "A spatial fractional diffusion model for predicting the characteristics of vocs emission in porous dry building material," *Science of The Total Environment*, vol. 704, p. 135342, 2020.
- [68] A. D. Obembe, "A fractional diffusion model for single-well simulation in geological media," *Journal of Petroleum Science and Engineering*, vol. 191, p. 107162, 2020.
- [69] G. Adomian, Solving frontier problems of physics: the decomposition method, vol. 60. Springer Science & Business Media, 2013.
- [70] Y. Lin and C. Xu, "Finite difference/spectral approximations for the time-fractional diffusion equation," *Journal of Computational Physics*, vol. 225, no. 2, pp. 1533– 1552, 2007.
- [71] J.-L. Wu, "A wavelet operational method for solving fractional partial differential equations numerically," *Applied Mathematics and Computation*, vol. 214, no. 1, pp. 31–40, 2009.
- [72] S. Das and P. Gupta, "Application of homotopy perturbation method and homotopy analysis method to fractional vibration equation," *International Journal of Computer Mathematics*, vol. 88, no. 2, pp. 430–441, 2011.

- [73] S. Das, "A note on fractional diffusion equations," Chaos, Solitons & Fractals, vol. 42, no. 4, pp. 2074–2079, 2009.
- [74] M. Zaky, S. Ezz-Eldien, E. Doha, J. T. Machado, and A. Bhrawy, "An efficient operational matrix technique for multidimensional variable-order time fractional diffusion equations," *Journal of Computational and Nonlinear Dynamics*, vol. 11, no. 6, p. 061002, 2016.
- [75] J. Q. Murillo and S. B. Yuste, "An explicit difference method for solving fractional diffusion and diffusion-wave equations in the caputo form," *Journal of Computational* and Nonlinear Dynamics, vol. 6, no. 2, p. 021014, 2011.
- [76] K. Razminia, A. Razminia, and J. T. Machado, "Analytical solution of fractional order diffusivity equation with wellbore storage and skin effects," *Journal of Computational and Nonlinear Dynamics*, vol. 11, no. 1, p. 011006, 2016.
- [77] K. Vishal, S. Kumar, and S. Das, "Application of homotopy analysis method for fractional swift hohenberg equation-revisited," *Applied Mathematical Modelling*, vol. 36, no. 8, pp. 3630–3637, 2012.
- [78] S. Das, P. K. Gupta, and P. Ghosh, "An approximate solution of nonlinear fractional reaction-diffusion equation," *Applied Mathematical Modelling*, vol. 35, no. 8, pp. 4071–4076, 2011.
- [79] A. Singh, S. Das, S. Ong, and H. Jafari, "Numerical solution of nonlinear reactionadvection-diffusion equation," *Journal of Computational and Nonlinear Dynamics*, vol. 14, no. 4, p. 041003, 2019.
- [80] S. Arshad, D. Baleanu, J. Huang, M. Al Qurashi, Y. Tang, and Y. Zhao, "Finite difference method for time-space fractional advection-diffusion equations with riesz derivative," *Entropy*, vol. 20, no. 5, p. 321, 2018.
- [81] A. Fernandez, D. Baleanu, and A. S. Fokas, "Solving pdes of fractional order using the unified transform method," *Applied Mathematics and Computation*, vol. 339, pp. 738–749, 2018.
- [82] W. Deng and Z. Zhang, "High accuracy algorithm for the differential equations governing anomalous diffusion," World Scientific, vol. 1, no. 350, pp. 978–981, 2019.
- [83] A. B. Koç, M. Çakmak, A. Kurnaz, and K. Uslu, "A new fibonacci type collocation procedure for boundary value problems," *Advances in Difference Equations*, vol. 2013, no. 1, p. 262, 2013.

- [84] A. B. Koç, M. Çakmak, and A. Kurnaz, "A matrix method based on the fibonacci polynomials to the generalized pantograph equations with functional arguments," *Advances in Mathematical Physics*, vol. 2014, 2014.
- [85] W. M. Abd-Elhameed and Y. H. Youssri, "A novel operational matrix of caputo fractional derivatives of fibonacci polynomials: spectral solutions of fractional differential equations," *Entropy*, vol. 18, no. 10, p. 345, 2016.
- [86] A. Saadatmandi and M. Dehghan, "A new operational matrix for solving fractionalorder differential equations," *Computers & mathematics with applications*, vol. 59, no. 3, pp. 1326–1336, 2010.
- [87] E. Tohidi and H. S. Nik, "A bessel collocation method for solving fractional optimal control problems," *Applied Mathematical Modelling*, vol. 39, no. 2, pp. 455–465, 2015.
- [88] E. H. Doha, A. Bhrawy, and S. Ezz-Eldien, "A chebyshev spectral method based on operational matrix for initial and boundary value problems of fractional order," *Computers & Mathematics with Applications*, vol. 62, no. 5, pp. 2364–2373, 2011.
- [89] J. Bear, Y. Bachmat, et al., "A generalized theory on hydrodynamic dispersion in porous media," in IASH symposium on artificial recharge and management of aquifers, vol. 72, pp. 7–16, IASH Publ. Int. Union Geod. Geophys, Haifa, Israel, 1967.
- [90] A. Younes, "A moving grid eulerian lagrangian localized adjoint method for solving one-dimensional nonlinear advection-diffusion-reaction equations," *Transport in porous media*, vol. 60, no. 2, pp. 241–250, 2005.
- [91] M. Ahmed, Q. U. A. Zainab, and S. Qamar, "Analysis of one-dimensional advectiondiffusion model with variable coefficients describing solute transport in a porous medium," *Transport in Porous Media*, vol. 118, no. 3, pp. 327–344, 2017.
- [92] J. S. P. Guerrero, T. H. Skaggs, and M. T. Van Genuchten, "Analytical solution for multi-species contaminant transport subject to sequential first-order decay reactions in finite media," *Transport in porous media*, vol. 80, no. 2, pp. 373–387, 2009.
- [93] W. Deng, B. Li, W. Tian, and P. Zhang, "Boundary problems for the fractional and tempered fractional operators," *Multiscale Modeling & Simulation*, vol. 16, no. 1, pp. 125–149, 2018.

- [94] E. H. Doha, W. M. Abd-Elhameed, and M. Bassuony, "New algorithms for solving high even-order differential equations using third and fourth chebyshev–galerkin methods," *Journal of Computational Physics*, vol. 236, pp. 563–579, 2013.
- [95] W. M. Abd-Elhameed, M. A. Bassuony, et al., "On the coefficients of differentiated expansions and derivatives of chebyshev polynomials of the third and fourth kinds," *Acta Mathematica Scientia*, vol. 35, no. 2, pp. 326–338, 2015.
- [96] E. Doha and W. Abd-Elhameed, "Efficient solutions of multidimensional sixth-order boundary value problems using symmetric generalized jacobi-galerkin method," in *Abstract and Applied Analysis*, vol. 2012, Hindawi, 2012.
- [97] W. Abd-Elhameed, E. Doha, and Y. Youssri, "Efficient spectral-petrov-galerkin methods for third-and fifth-order differential equations using general parameters generalized jacobi polynomials," *Quaestiones Mathematicae*, vol. 36, no. 1, pp. 15–38, 2013.
- [98] P. Chang, A. Kanwal, L. J. Rong, and A. Isah, "Legendre operational matrix for solving fractional partial differential equations," *International Journal of Mathematical Analysis*, vol. 10, no. 19, pp. 903–11, 2016.
- [99] J. Biazar and H. Aminikhah, "Exact and numerical solutions for non-linear burger's equation by vim," *Mathematical and Computer Modelling*, vol. 49, no. 7-8, pp. 1394– 1400, 2009.
- [100] S. Momani and A. Yıldırım, "Analytical approximate solutions of the fractional convection-diffusion equation with nonlinear source term by he's homotopy perturbation method," *International Journal of Computer Mathematics*, vol. 87, no. 5, pp. 1057–1065, 2010.
- [101] D. W. Peaceman and H. H. Rachford, Jr, "The numerical solution of parabolic and elliptic differential equations," *Journal of the Society for industrial and Applied Mathematics*, vol. 3, no. 1, pp. 28–41, 1955.
- [102] C. Tadjeran and M. M. Meerschaert, "A second-order accurate numerical method for the two-dimensional fractional diffusion equation," *Journal of Computational Physics*, vol. 220, no. 2, pp. 813–823, 2007.
- [103] F.-R. Lin, S.-W. Yang, and X.-Q. Jin, "Preconditioned iterative methods for fractional diffusion equation," *Journal of Computational Physics*, vol. 256, pp. 109–117, 2014.

- [104] Y. Yao, "Exact solution of nonlinear diffusion equation for fluid flow in fractal reservoirs," Special Topics & Reviews in Porous Media: An International Journal, vol. 1, no. 3, 2010.
- [105] H. Wang, K. Wang, and T. Sircar, "A direct o (n log2 n) finite difference method for fractional diffusion equations," *Journal of Computational Physics*, vol. 229, no. 21, pp. 8095–8104, 2010.
- [106] S. N. Sallam, "Thermal-diffusion and diffusion-thermo effects on mixed convection heat and mass transfer in a porous medium," *Journal of Porous Media*, vol. 13, no. 4, 2010.
- [107] M. Khader, "On the numerical solutions for the fractional diffusion equation," Communications in Nonlinear Science and Numerical Simulation, vol. 16, no. 6, pp. 2535– 2542, 2011.
- [108] M. Molati and H. Murakawa, "Exact solutions of nonlinear diffusion-convectionreaction equation: A lie symmetry analysis approach," *Communications in Nonlin*ear Science and Numerical Simulation, 2018.
- [109] S. Jaiswal, M. Chopra, and S. Das, "Numerical solution of a space fractional order solute transport system," *Journal of Porous Media*, vol. 21, no. 2, 2018.
- [110] G. Matheron and G. De Marsily, "Is transport in porous media always diffusive? a counterexample," Water Resources Research, vol. 16, no. 5, pp. 901–917, 1980.
- [111] Y. Mualem, "A new model for predicting the hydraulic conductivity of unsaturated porous media," Water resources research, vol. 12, no. 3, pp. 513–522, 1976.
- [112] C. Wang and P. Cheng, "A multiphase mixture model for multiphase, multicomponent transport in capillary porous media—i. model development," *International journal of heat and mass transfer*, vol. 39, no. 17, pp. 3607–3618, 1996.
- [113] J. Valencia-López, G. Espinosa-Paredes, and J. A. Ochoa-Tapia, "Mass transfer jump condition at the boundary between a porous medium and a homogeneous fluid," *Journal of Porous Media*, vol. 6, no. 1, 2003.
- [114] J. Gómez-Aguilar, M. Miranda-Hernández, M. López-López, V. Alvarado-Martínez, and D. Baleanu, "Modeling and simulation of the fractional space-time diffusion equation," *Communications in Nonlinear Science and Numerical Simulation*, vol. 30, no. 1-3, pp. 115–127, 2016.

- [115] R. Chand and G. Rana, "Electrothermo convection of rotating nanofluid in brinkman porous medium," Special Topics & Reviews in Porous Media: An International Journal, vol. 7, no. 2, 2016.
- [116] S. Das, "Analytical solution of a fractional diffusion equation by variational iteration method," Computers & Mathematics with Applications, vol. 57, no. 3, pp. 483–487, 2009.
- [117] S. Das, K. Vishal, and P. Gupta, "Solution of the nonlinear fractional diffusion equation with absorbent term and external force," *Applied Mathematical Modelling*, vol. 35, no. 8, pp. 3970–3979, 2011.
- [118] S. Das, K. Vishal, P. Gupta, and A. Yildirim, "An approximate analytical solution of time-fractional telegraph equation," *Applied Mathematics and Computation*, vol. 217, no. 18, pp. 7405–7411, 2011.
- [119] O. A. Arqub, "Fitted reproducing kernel hilbert space method for the solutions of some certain classes of time-fractional partial differential equations subject to initial and neumann boundary conditions," *Computers & Mathematics with Applications*, vol. 73, no. 6, pp. 1243–1261, 2017.
- [120] O. Abu Arqub, "Numerical solutions for the robin time-fractional partial differential equations of heat and fluid flows based on the reproducing kernel algorithm," *International Journal of Numerical Methods for Heat & Fluid Flow*, vol. 28, no. 4, pp. 828–856, 2018.
- [121] O. Abu Arqub and M. Al-Smadi, "Numerical algorithm for solving time-fractional partial integrodifferential equations subject to initial and dirichlet boundary conditions," *Numerical Methods for Partial Differential Equations*, vol. 34, no. 5, pp. 1577– 1597, 2018.
- [122] O. Abu Arqub, "Solutions of time-fractional tricomi and keldysh equations of dirichlet functions types in hilbert space," Numerical Methods for Partial Differential Equations, vol. 34, no. 5, pp. 1759–1780, 2018.
- [123] A. D. Obembe, S. A. Abu-Khamsin, and M. E. Hossain, "Anomalous effects during thermal displacement in porous media under non-local thermal equilibrium," *Journal* of Porous Media, vol. 21, no. 2, 2018.
- [124] F. Mirzaee and S. F. Hoseini, "A fibonacci collocation method for solving a class of fredholm–volterra integral equations in two-dimensional spaces," *Beni-Suef Univer*sity Journal of Basic and Applied Sciences, vol. 3, no. 2, pp. 157–163, 2014.

- [125] M. Razzaghi and S. Yousefi, "The legendre wavelets operational matrix of integration," *International Journal of Systems Science*, vol. 32, no. 4, pp. 495–502, 2001.
- [126] E. Babolian and F. Fattahzadeh, "Numerical solution of differential equations by using chebyshev wavelet operational matrix of integration," *Applied Mathematics* and computation, vol. 188, no. 1, pp. 417–426, 2007.
- [127] H. Neudecker, "A note on kronecker matrix products and matrix equation systems," SIAM Journal on Applied Mathematics, vol. 17, no. 3, pp. 603–606, 1969.
- [128] C. F. Van Loan, "The ubiquitous kronecker product," Journal of computational and applied mathematics, vol. 123, no. 1-2, pp. 85–100, 2000.
- [129] A. N. Langville and W. J. Stewart, "The kronecker product and stochastic automata networks," *Journal of computational and applied mathematics*, vol. 167, no. 2, pp. 429–447, 2004.
- [130] J.-e. Feng, J. Lam, and Y. Wei, "Spectral properties of sums of certain kronecker products," *Linear Algebra and its Applications*, vol. 431, no. 9, pp. 1691–1701, 2009.
- [131] A. Graham, Kronecker products and matrix calculus with applications. Courier Dover Publications, 2018.
- [132] N. H. Sweilam and T. F. Almajbri, "Large stability regions method for the twodimensional fractional diffusion equation," *Progress in Fractional Differentiation and Applications*, vol. 1, no. 2, pp. 123–131, 2015.
- [133] J. Macías-Díaz, "A bounded finite-difference discretization of a two-dimensional diffusion equation with logistic nonlinear reaction," *International Journal of Modern Physics C*, vol. 22, no. 09, pp. 953–966, 2011.
- [134] R. Gorenflo and F. Mainardi, "Random walk models approximating symmetric space-fractional diffusion processes," in *Problems and Methods in Mathematical Physics*, pp. 120–145, Springer, 2001.
- [135] D. del Castillo-Negrete, B. Carreras, and V. Lynch, "Nondiffusive transport in plasma turbulence: a fractional diffusion approach," *Physical review letters*, vol. 94, no. 6, p. 065003, 2005.
- [136] E. Gerolymatou, I. Vardoulakis, and R. Hilfer, "Modelling infiltration by means of a nonlinear fractional diffusion model," *Journal of Physics D: Applied Physics*, vol. 39, no. 18, p. 4104, 2006.

- [137] H. Deans, "A mathematical model for dispersion in the direction of flow in porous media," Society of Petroleum Engineers Journal, vol. 3, no. 01, pp. 49–52, 1963.
- [138] X. Feng, "Strong solutions to a nonlinear parabolic system modeling compressible miscible displacement in porous media," Nonlinear Analysis: Theory, Methods & Applications, vol. 23, no. 12, pp. 1515–1531, 1994.
- [139] A.-R. Khaled and K. Vafai, "The role of porous media in modeling flow and heat transfer in biological tissues," *International Journal of Heat and Mass Transfer*, vol. 46, no. 26, pp. 4989–5003, 2003.
- [140] C. Choquet, "On a nonlinear parabolic system modelling miscible compressible displacement in porous media," Nonlinear Analysis: Theory, Methods & Applications, vol. 61, no. 1-2, pp. 237–260, 2005.
- [141] W. F. Ames, Nonlinear partial differential equations in engineering. Academic press, 1965.
- [142] J. D. Murray, Lectures on nonlinear-differential-equation models in biology. Clarendon Press, 1977.
- [143] J. D. Murray, "Mathematical biology I: An introduction, Spriger," 2002.
- [144] J. D. Murray, "Mathematical biology II: Spatial models and biomedical applications, Spriger," 2003.
- [145] A. Okubo and S. A. Levin, Diffusion and ecological problems: modern perspectives, vol. 14. Springer Science & Business Media, 2013.
- [146] E. Burman, P. Hansbo, M. G. Larson, A. Massing, and S. Zahedi, "A stabilized cut streamline diffusion finite element method for convection-diffusion problems on surfaces," *Computer Methods in Applied Mechanics and Engineering*, vol. 358, p. 112645, 2020.
- [147] M. E. Rose, "Compact finite volume methods for the diffusion equation," Journal of scientific computing, vol. 4, no. 3, pp. 261–290, 1989.
- [148] T. Zhang and Y. Chen, "An analysis of the weak galerkin finite element method for convection-diffusion equations," *Applied Mathematics and Computation*, vol. 346, pp. 612–621, 2019.

- [149] J. Zhang, X. Zhang, and B. Yang, "An approximation scheme for the time fractional convection-diffusion equation," *Applied Mathematics and Computation*, vol. 335, pp. 305–312, 2018.
- [150] A. D. Polyanin, "Functional separable solutions of nonlinear reaction-diffusion equations with variable coefficients," *Applied Mathematics and Computation*, vol. 347, pp. 282–292, 2019.
- [151] G. Fairweather, X. Yang, D. Xu, and H. Zhang, "An adi crank-nicolson orthogonal spline collocation method for the two-dimensional fractional diffusion-wave equation," *Journal of Scientific Computing*, vol. 65, no. 3, pp. 1217–1239, 2015.
- [152] M. Hajipour, A. Jajarmi, D. Baleanu, and H. Sun, "On an accurate discretization of a variable-order fractional reaction-diffusion equation," *Communications in Nonlinear Science and Numerical Simulation*, vol. 69, pp. 119–133, 2019.
- [153] A. Kanwal, C. Phang, and U. Iqbal, "Numerical solution of fractional diffusion wave equation and fractional klein–gordon equation via two-dimensional genocchi polynomials with a ritz–galerkin method," *Computation*, vol. 6, no. 3, p. 40, 2018.
- [154] H. Zhang, X. Yang, and D. Xu, "An efficient spline collocation method for a nonlinear fourth-order reaction subdiffusion equation," *Journal of Scientific Computing*, vol. 85, no. 1, pp. 1–18, 2020.
- [155] M. Neamtu and L. L. Schumaker, "On the approximation order of splines on spherical triangulations," Advances in Computational Mathematics, vol. 21, no. 1-2, pp. 3–20, 2004.
- [156] V. Baramidze and M.-J. Lai, "Error bounds for minimal energy interpolatory spherical splines," Approximation Theory XI, Nashboro Press, Brentwood, pp. 25–50, 2005.
- [157] N. A. Khan, A. Ara, S. A. Ali, and A. Mahmood, "Analytical study of navier-stokes equation with fractional orders using he's homotopy perturbation and variational iteration methods," *International Journal of Nonlinear Sciences and Numerical Simulation*, vol. 10, no. 9, pp. 1127–1134, 2009.
- [158] S. Das, "Solution of fractional vibration equation by the variational iteration method and modified decomposition method," *International Journal of Nonlinear Sciences* and Numerical Simulation, vol. 9, no. 4, pp. 361–366, 2008.

- [159] J. Yu and J.-G. Huang, "Application of homotopy perturbation method for the reaction-diffusion equation," *International Journal of Nonlinear Sciences and Numerical Simulation*, vol. 11, no. Supplement, pp. 61–64, 2010.
- [160] I. Ateş and A. Yildirim, "Application of variational iteration method to fractional initial-value problems," *International Journal of Nonlinear Sciences and Numerical Simulation*, vol. 10, no. 7, pp. 877–884, 2009.
- [161] L. Qiao and D. Xu, "Bdf adi orthogonal spline collocation scheme for the fractional integro-differential equation with two weakly singular kernels," *Computers & Mathematics with Applications*, vol. 78, no. 12, pp. 3807–3820, 2019.
- [162] C. Phang, A. Kanwal, and J. R. Loh, "New collocation scheme for solving fractional partial differential equations," *Hacettepe Journal of Mathematics and Statistics*, vol. 49, no. 3, pp. 1107–1125, 2020.
- [163] S. S. Siddiqi and S. Arshed, "Quintic b-spline for the numerical solution of the good boussinesq equation," *Journal of the Egyptian Mathematical Society*, vol. 22, no. 2, pp. 209–213, 2014.
- [164] I. Wasim, M. Abbas, and M. Amin, "Hybrid b-spline collocation method for solving the generalized burgers-fisher and burgers-huxley equations," *Mathematical Problems in Engineering*, vol. 2018, 2018.
- [165] J. Stoer and R. Bulirsch, Introduction to numerical analysis, vol. 12. Springer Science & Business Media, 2013.
- [166] M. K. Kadalbajoo, V. Gupta, and A. Awasthi, "A uniformly convergent b-spline collocation method on a nonuniform mesh for singularly perturbed one-dimensional time-dependent linear convection-diffusion problem," *Journal of Computational and Applied Mathematics*, vol. 220, no. 1-2, pp. 271–289, 2008.
- [167] W. Rudin, Principles of mathematical analysis, vol. 3. McGraw-hill, New York, 1976.
- [168] M. Chawla, M. Al-Zanaidi, and M. Al-Aslab, "Extended one-step time-integration schemes for convection-diffusion equations," *Computers & Mathematics with Applications*, vol. 39, no. 3-4, pp. 71–84, 2000.
- [169] H. B. Jebreen, "On the numerical solution of fisher's equation by an efficient algorithm based on multiwavelets [j]," AIMS Mathematics, vol. 6, no. 3, pp. 2369–2384, 2021.

- [170] M. Uddin and S. Haq, "Rbfs approximation method for time fractional partial differential equations," *Communications in Nonlinear Science and Numerical Simulation*, vol. 16, no. 11, pp. 4208–4214, 2011.
- [171] B. Carreras, V. Lynch, and G. Zaslavsky, "Anomalous diffusion and exit time distribution of particle tracers in plasma turbulence model," *Physics of Plasmas*, vol. 8, no. 12, pp. 5096–5103, 2001.
- [172] O. P. Agrawal, "A general formulation and solution scheme for fractional optimal control problems," *Nonlinear Dynamics*, vol. 38, no. 1-4, pp. 323–337, 2004.
- [173] M. S. Azad and J. J. Trivedi, "Novel viscoelastic model for predicting the synthetic polymer's viscoelastic behavior in porous media using direct extensional rheological measurements," *Fuel*, vol. 235, pp. 218–226, 2019.
- [174] A. Akgül and M. Modanli, "Crank-nicholson difference method and reproducing kernel function for third order fractional differential equations in the sense of atanganabaleanu caputo derivative," Chaos, Solitons & Fractals, vol. 127, pp. 10–16, 2019.
- [175] E. K. Akgül, "Solutions of the linear and nonlinear differential equations within the generalized fractional derivatives," *Chaos: An Interdisciplinary Journal of Nonlinear Science*, vol. 29, no. 2, p. 023108, 2019.
- [176] A. Akgül, A. Cordero, and J. R. Torregrosa, "A fractional newton method with 2αth-order of convergence and its stability," *Applied Mathematics Letters*, vol. 98, pp. 344–351, 2019.
- [177] A. Akgül, "Reproducing kernel method for fractional derivative with non-local and non-singular kernel," in *Fractional Derivatives with Mittag-Leffler Kernel*, pp. 1–12, Springer, 2019.
- [178] A. Akgül, "A novel method for a fractional derivative with non-local and non-singular kernel," Chaos, Solitons & Fractals, vol. 114, pp. 478–482, 2018.
- [179] A. R. Kanth and N. Garg, "An implicit numerical scheme for a class of multi-term time-fractional diffusion equation," *The European Physical Journal Plus*, vol. 134, no. 6, p. 312, 2019.
- [180] A. M. Tawfik, H. Fichtner, A. Elhanbaly, and R. Schlickeiser, "General solution of a fractional parker diffusion-convection equation describing the superdiffusive transport of energetic particles," *The European Physical Journal Plus*, vol. 133, no. 6, p. 209, 2018.

- [181] M. Sheikholeslami, "New computational approach for exergy and entropy analysis of nanofluid under the impact of lorentz force through a porous media," Computer Methods in Applied Mechanics and Engineering, vol. 344, pp. 319–333, 2019.
- [182] D. Crevillén-García, P. Leung, A. Rodchanarowan, and A. Shah, "Uncertainty quantification for flow and transport in highly heterogeneous porous media based on simultaneous stochastic model dimensionality reduction," *Transport in Porous Media*, pp. 1–17, 2019.
- [183] S. Z. Alamri, R. Ellahi, N. Shehzad, and A. Zeeshan, "Convective radiative plane poiseuille flow of nanofluid through porous medium with slip: an application of stefan blowing," *Journal of Molecular Liquids*, vol. 273, pp. 292–304, 2019.
- [184] H. Rusinque and G. Brenner, "Mass transport in porous media at the micro-and nanoscale: A novel method to model hindered diffusion," *Microporous and Mesoporous Materials*, vol. 280, pp. 157–165, 2019.
- [185] A. Cartalade, A. Younsi, and M.-C. Néel, "Multiple-relaxation-time lattice boltzmann scheme for fractional advection-diffusion equation," *Computer Physics Communications*, vol. 234, pp. 40–54, 2019.
- [186] X. Xiao, K. Wang, and X. Feng, "A lifted local galerkin method for solving the reaction-diffusion equations on implicit surfaces," *Computer Physics Communications*, vol. 231, pp. 107–113, 2018.
- [187] S. B. Yuste and J. Quintana-Murillo, "A finite difference method with non-uniform timesteps for fractional diffusion equations," *Computer Physics Communications*, vol. 183, no. 12, pp. 2594–2600, 2012.
- [188] A. Atangana and J. Botha, "Analytical solution of the groundwater flow equation obtained via homotopy decomposition method," J. Earth Sci. Climate Change, vol. 3, p. 115, 2012.
- [189] A. Atangana, "On the stability and convergence of the time-fractional variable order telegraph equation," *Journal of Computational Physics*, vol. 293, pp. 104–114, 2015.
- [190] P. Pandey, S. Kumar, and S. Das, "Approximate analytical solution of coupled fractional order reaction-advection-diffusion equations," *The European Physical Journal Plus*, vol. 134, no. 7, p. 364, 2019.

- [191] M. Javidi, "Spectral collocation method for the solution of the generalized burgerfisher equation," Applied Mathematics and Computation, vol. 174, no. 1, pp. 345–352, 2006.
- [192] C.-G. Zhu and W.-S. Kang, "Numerical solution of burgers-fisher equation by cubic b-spline quasi-interpolation," *Applied Mathematics and Computation*, vol. 216, no. 9, pp. 2679–2686, 2010.
- [193] M. Rashidi, D. Ganji, and S. Dinarvand, "Explicit analytical solutions of the generalized burger and burger-fisher equations by homotopy perturbation method," *Numerical Methods for Partial Differential Equations: An International Journal*, vol. 25, no. 2, pp. 409–417, 2009.
- [194] R. FitzHugh, "Impulses and physiological states in theoretical models of nerve membrane," *Biophysical journal*, vol. 1, no. 6, pp. 445–466, 1961.
- [195] J. Nagumo, S. Arimoto, and S. Yoshizawa, "An active pulse transmission line simulating nerve axon," *Proceedings of the IRE*, vol. 50, no. 10, pp. 2061–2070, 1962.
- [196] H. Li and Y. Guo, "New exact solutions to the fitzhugh-nagumo equation," Applied Mathematics and Computation, vol. 180, no. 2, pp. 524–528, 2006.
- [197] M. Shih, E. Momoniat, and F. Mahomed, "Approximate conditional symmetries and approximate solutions of the perturbed fitzhugh–nagumo equation," *Journal of mathematical physics*, vol. 46, no. 2, p. 023503, 2005.
- [198] S. Abbasbandy, "Soliton solutions for the fitzhugh-nagumo equation with the homotopy analysis method," *Applied Mathematical Modelling*, vol. 32, no. 12, pp. 2706– 2714, 2008.
- [199] R. E. Mickens, Nonstandard finite difference models of differential equations. world scientific, 1994.
- [200] R. E. Mickens, "A nonstandard finite-difference scheme for the lotka-volterra system," Applied Numerical Mathematics, vol. 45, no. 2-3, pp. 309–314, 2003.
- [201] R. Buckmire, "Application of a mickens finite-difference scheme to the cylindrical bratu-gelfand problem," Numerical Methods for Partial Differential Equations: An International Journal, vol. 20, no. 3, pp. 327–337, 2004.
- [202] P. K. Pandey, "Non-standard finite difference method for numerical solution of second order linear fredholm integro-differential equations," International Journal of Mathematical Modelling & Computations, vol. 5, no. 3, pp. 259–266, 2015.

- [203] R. E. Mickens, "Exact solutions to a finite-difference model of a nonlinear reactionadvection equation: Implications for numerical analysis," *Numerical Methods for Partial Differential Equations*, vol. 5, no. 4, pp. 313–325, 1989.
- [204] R. E. Mickens, Applications of nonstandard finite difference schemes. World Scientific, 2000.
- [205] V. F. Morales-Delgado, J. F. Gómez-Aguilar, H. Yépez-Martínez, D. Baleanu, R. F. Escobar-Jimenez, and V. H. Olivares-Peregrino, "Laplace homotopy analysis method for solving linear partial differential equations using a fractional derivative with and without kernel singular," Advances in Difference Equations, vol. 2016, no. 1, p. 164, 2016.
- [206] N. Sweilam, A. Nagy, and A. A. El-Sayed, "Second kind shifted chebyshev polynomials for solving space fractional order diffusion equation," *Chaos, Solitons & Fractals*, vol. 73, pp. 141–147, 2015.
- [207] P. Agarwal and A. El-Sayed, "Non-standard finite difference and chebyshev collocation methods for solving fractional diffusion equation," *Physica A: Statistical Mechanics and its Applications*, vol. 500, pp. 40–49, 2018.
- [208] C. Tadjeran, M. M. Meerschaert, and H.-P. Scheffler, "A second-order accurate numerical approximation for the fractional diffusion equation," *Journal of Computational Physics*, vol. 213, no. 1, pp. 205–213, 2006.
- [209] O. E. Hepson, "An extended cubic b–spline finite element method for solving generalized burgers–fisher equation," in AIP Conference Proceedings, vol. 1978, p. 470100, AIP Publishing, 2018.
- [210] F. Mainardi, Fractional calculus and waves in linear viscoelasticity: an introduction to mathematical models. World Scientific, 2010.
- [211] R. Metzler and J. Klafter, "The random walk's guide to anomalous diffusion: a fractional dynamics approach," *Physics reports*, vol. 339, no. 1, pp. 1–77, 2000.
- [212] D. Tavares, R. Almeida, and D. F. Torres, "Caputo derivatives of fractional variable order: numerical approximations," *Communications in Nonlinear Science and Numerical Simulation*, vol. 35, pp. 69–87, 2016.
- [213] B. Yu, X. Jiang, and H. Xu, "A novel compact numerical method for solving the two-dimensional non-linear fractional reaction-subdiffusion equation," *Numerical Al*gorithms, vol. 68, no. 4, pp. 923–950, 2015.

- [214] Y. Zhang and L. Zheng, "Analysis of mhd thermosolutal marangoni convection with the heat generation and a first-order chemical reaction," *Chemical Engineering Science*, vol. 69, no. 1, pp. 449–455, 2012.
- [215] H. Zhang, X. Jiang, and X. Yang, "A time-space spectral method for the time-space fractional fokker-planck equation and its inverse problem," *Applied Mathematics* and Computation, vol. 320, pp. 302–318, 2018.
- [216] L. Zheng, Y. Liu, and X. Zhang, "Slip effects on mhd flow of a generalized oldroydb fluid with fractional derivative," *Nonlinear Analysis: Real World Applications*, vol. 13, no. 2, pp. 513–523, 2012.
- [217] N. N. Leonenko, M. M. Meerschaert, and A. Sikorskii, "Fractional pearson diffusions," *Journal of mathematical analysis and applications*, vol. 403, no. 2, pp. 532– 546, 2013.
- [218] V. V. Uchaikin, Fractional derivatives for physicists and engineers, vol. 2. Springer, 2013.
- [219] V. Daftardar-Gejji, "Fractional calculus: Theory and applications," Narosa, New Delhi, 2013.
- [220] Y. A. Rossikhin and M. V. Shitikova, "Applications of fractional calculus to dynamic problems of linear and nonlinear hereditary mechanics of solids," *Applied Mechanics Reviews*, vol. 50, no. 1, pp. 15–67, 1997.
- [221] E. J. Carr and M. J. Simpson, "New homogenization approaches for stochastic transport through heterogeneous media," *The Journal of chemical physics*, vol. 150, no. 4, p. 044104, 2019.
- [222] R. Haggerty and S. M. Gorelick, "Multiple-rate mass transfer for modeling diffusion and surface reactions in media with pore-scale heterogeneity," *Water Resources Research*, vol. 31, no. 10, pp. 2383–2400, 1995.
- [223] M. M. Meerschaert, Y. Zhang, and B. Baeumer, "Tempered anomalous diffusion in heterogeneous systems," *Geophysical Research Letters*, vol. 35, no. 17, 2008.
- [224] R. Gillham, E. Sudicky, J. Cherry, and E. Frind, "An advection-diffusion concept for solute transport in heterogeneous unconsolidated geological deposits," *Water Resources Research*, vol. 20, no. 3, pp. 369–378, 1984.

- [225] A. Tayebi, Y. Shekari, and M. Heydari, "A meshless method for solving twodimensional variable-order time fractional advection-diffusion equation," *Journal* of Computational Physics, vol. 340, pp. 655–669, 2017.
- [226] M. Hosseininia, M. Heydari, Z. Avazzadeh, and F. M. Ghaini, "Two-dimensional legendre wavelets for solving variable-order fractional nonlinear advection-diffusion equation with variable coefficients," *International Journal of Nonlinear Sciences and Numerical Simulation*, vol. 19, no. 7-8, pp. 793–802, 2018.
- [227] M. H. Heydari, "A new direct method based on the chebyshev cardinal functions for variable-order fractional optimal control problems," *Journal of the Franklin Institute*, vol. 355, no. 12, pp. 4970–4995, 2018.
- [228] M. Heydari, M. R. Hooshmandasl, C. Cattani, and G. Hariharan, "An optimization wavelet method for multi variable-order fractional differential equations," *Fundamenta Informaticae*, vol. 151, no. 1-4, pp. 255–273, 2017.
- [229] A. Heydari, "Stability analysis of optimal adaptive control using value iteration with approximation errors," *IEEE Transactions on Automatic Control*, vol. 63, no. 9, pp. 3119–3126, 2018.
- [230] M. Heydari and Z. Avazzadeh, "An operational matrix method for solving variableorder fractional biharmonic equation," *Computational and Applied Mathematics*, vol. 37, no. 4, pp. 4397–4411, 2018.
- [231] M. H. Heydari and Z. Avazzadeh, "Legendre wavelets optimization method for variable-order fractional poisson equation," *Chaos, Solitons & Fractals*, vol. 112, pp. 180–190, 2018.
- [232] M. H. Heydari, Z. Avazzadeh, and M. F. Haromi, "A wavelet approach for solving multi-term variable-order time fractional diffusion-wave equation," *Applied Mathematics and Computation*, vol. 341, pp. 215–228, 2019.
- [233] A. Bhrawy, E. Doha, S. Ezz-Eldien, and M. Abdelkawy, "A numerical technique based on the shifted legendre polynomials for solving the time-fractional coupled kdv equations," *Calcolo*, vol. 53, no. 1, pp. 1–17, 2016.
- [234] Y.-M. Chen, Y.-Q. Wei, D.-Y. Liu, and H. Yu, "Numerical solution for a class of nonlinear variable order fractional differential equations with legendre wavelets," *Applied Mathematics Letters*, vol. 46, pp. 83–88, 2015.

- [235] M. Abdelkawy, M. Zaky, A. Bhrawy, and D. Baleanu, "Numerical simulation of time variable fractional order mobile-immobile advection-dispersion model," *Rom. Rep. Phys*, vol. 67, no. 3, pp. 773–791, 2015.
- [236] M. Zayernouri and G. E. Karniadakis, "Fractional spectral collocation methods for linear and nonlinear variable order fpdes," *Journal of Computational Physics*, vol. 293, pp. 312–338, 2015.
- [237] A. Bhrawy and M. Zaky, "Numerical simulation for two-dimensional variable-order fractional nonlinear cable equation," *Nonlinear Dynamics*, vol. 80, no. 1-2, pp. 101– 116, 2015.
- [238] N. Sweilam, M. Khader, and H. Almarwm, "Numerical studies for the variableorder nonlinear fractional wave equation," *Fractional Calculus and Applied Analysis*, vol. 15, no. 4, pp. 669–683, 2012.
- [239] Y. Chen, L. Liu, B. Li, and Y. Sun, "Numerical solution for the variable order linear cable equation with bernstein polynomials," *Applied Mathematics and Computation*, vol. 238, pp. 329–341, 2014.
- [240] S. Shen, F. Liu, J. Chen, I. Turner, and V. Anh, "Numerical techniques for the variable order time fractional diffusion equation," *Applied Mathematics and Computation*, vol. 218, no. 22, pp. 10861–10870, 2012.
- [241] R. Lin, F. Liu, V. Anh, and I. Turner, "Stability and convergence of a new explicit finite-difference approximation for the variable-order nonlinear fractional diffusion equation," *Applied Mathematics and Computation*, vol. 212, no. 2, pp. 435–445, 2009.
- [242] R. Chen, F. Liu, and V. Anh, "Numerical methods and analysis for a multi-term time-space variable-order fractional advection-diffusion equations and applications," *Journal of Computational and Applied Mathematics*, vol. 352, pp. 437–452, 2019.

List of Publications

(Published)

- Kushal Dhar Dwivedi, Rajeev, S. Das, D. Baleanu, "Numerical Solution of Nonlinear Space–Time Fractional-Order Advection–Reaction–Diffusion Equation", Journal of Computational and Nonlinear Dynamics, (ASME), 15(2020)061005.
- Kushal Dhar Dwivedi, Rajeev, S. Das, "Fibonacci Collocation Method to solve two-dimensional nonlinear fractional order advection-reaction diffusion equation", Special Topics & Reviews in Porous Media: An International Journal, (Begel House), 10(2019)569-584.
- Kushal Dhar Dwivedi, S. Das, Rajeev, D. Baleanu, "Numerical solution of highly non-linear fractional order reaction advection diffusion equation using cubic B-spline collocation method", *International Journal of Nonlinear Sciences and Numerical* Simulation, (De Gruyter)(2021) doi.org/10.1515/ijnsns-2020-0112.
- Kushal Dhar Dwivedi, S. Das, "Numerical solution of the nonlinear diffusion equation by using non-standard/standard finite difference and Fibonacci collocation methods", The European Physical Journal Plus, (Springer), 134(2019)608.
- Kushal Dhar Dwivedi, Rajeev, S. Das, J.F. Gomez-Aguilar, "Finite difference/collocation method to solve multi term variable-order fractional reaction-advectiondiffusion equation in heterogeneous medium", Numerical Methods for Partial Differential Equations, (Wiley), 37(2020)2031-2045.
- Kushal Dhar Dwivedi, Rajeev, "Numerical solution of fractional order advection reaction diffusion equation with Fibonacci neural network", *Neural Processing Letters, (Springer)*, 53(2021)2687–2699.