

## Curriculum Vitae

### **Bengisen PEKMEN**

Professor  
Department of Mathematics  
TED University  
Ziya Gokalp Caddesi, No:47-48, 06420,  
Kolej-Cankaya, Ankara, Türkiye  
E-mail : bengisenpekmen@gmail.com



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### **Education**

- **Ph.D.** in Scientific Computing, Middle East Technical University, March 2014.  
Thesis Title : DRBEM Applications in Fluid Dynamics Problems and DQM  
Solutions of Hyperbolic Equations  
Thesis Advisor: Prof. Dr. Münevver Tezer-Sezgin
- **M.Sc.** in Scientific Computing, Middle East Technical University, August 2009.  
Thesis Title : Derivative free multilevel optimization methods  
Thesis Advisors: Prof. Dr. Bülent Karasözen & Prof. Dr. Ömür Uğur
- **B.Sc.**  
(major) in Department of Mathematics, Middle East Technical University, June 2007  
(minor) in Department of Physics, Middle East Technical University, August 2007.

### **Research**

- Radial basis functions (RBF) based pseudo spectral method, local RBF methods,  
Dual reciprocity boundary element method (DRBEM)  
Differential Quadrature Method (DQM)  
Nanofluid flow  
Magnetohydrodynamics  
Natural and Mixed convection flow  
Porous medium, Mathematical Biology

### **Teaching Experience**

- Lecturer in TED University (September 2014 - Present)  
Math101 - Calculus of One Variable  
Math112 - Introduction to Linear Algebra and Multivariable Calculus  
Math102 - Multivariable Calculus  
Math203 - Linear Algebra and Differential Equations  
Math204 - Vector and Complex Calculus

Math502 - Numerical Optimization (M.Sc. Course of Mechatronics & Mech. Eng.)  
Math221 - Linear Algebra 1 (Dept. of Math.)  
Math113 - Calculus I (Dept. of Math.)  
Math352 - Numerical Methods (Dept. of Math.)

- Teaching Assistant in Atilim University (October 2009 – August 2014 )  
Assistantship in Mathematical Analysis I-II, Calculus I-II, Basic Logic and Algebra,  
Advanced Calculus I-II, Numerical Analysis.

### Visitor

- **Visiting Researcher** (February 4, 2022 - April 6, 2022) in  
Uppsala University, Department of Information Technology, Division of Scientific  
Computing, Uppsala, Sweden

### Fellowships

- **D.A.A.D** ( October 2008 – December 2008 )  
Grant for 3 months to Darmstadt Technical University of Darmstadt in Germany.

### Publications

- Bengisen Pekmen, Ummuhan Yirmili, “Numerical and Statistical Approach on Chemotaxis-Haptotaxis Model for Cancer Cell Invasion of Tissue”, AIMS Mathematics Modelling and Control, 4 (2024)195--207, <https://doi.org/10.3934/mmc.2024017>
- Bengisen Pekmen Geridonmez, “Modeling of Average Nusselt Number by Machine Learning and Interpolation Techniques”, ASME Journal of Heat and Mass Transfer, 146 (4) (2024) 042601, <https://doi.org/10.1115/1.4064562>
- Bengisen Pekmen Geridonmez, Hakan Fehmi Oztop, “Magnetotactic bacteria and Fe<sub>3</sub>O<sub>4</sub>-water in a wavy walled cavity”, 34(4) (2024) 1609-1630, International Journal of Numerical Methods for Heat and Fluid Flow <https://doi.org/10.1108/HFF-08-2023-0465>
- S. Hussain, M. A. Qureshi, B. Pekmen Geridonmez, “Impact of wavy porous layer on mixed convection flow of a hybrid nanofluid in an enclosure under the effect of partial magnetic field”, 2023, Numerical Heat Transfer, Part A : Applications, <https://doi.org/10.1080/10407782.2023.2233144>
- B. Pekmen Geridonmez, M. Ali Atilgan, “Numerical and machine learning approaches in nanofluid natural convection flow in a wavy cavity”, Engineering Analysis with Boundary Elements, 155 (2023) 297-306. <https://doi.org/10.1016/j.enganabound.2023.06.009>
- B. Pekmen Geridonmez, H. F. Oztop, “Entropy generation due to magneto-convection of a hybrid nanofluid in the presence of a wavy conducting wall”, Mathematics 10(4) (2022) 4663, <https://doi.org/10.3390/math10244663>.

- Conjugate natural convection flow of a nanofluid with oxytactic bacteria under the effect of a periodic magnetic field, *Journal of Magnetism and Magnetic Materials* 564 (2022) 170135, <https://doi.org/10.1016/j.jmmm.2022.170135>.
- B. Pekmen Geridonmez, H.F. Oztop, “Natural convection of hybrid nanofluid flow in the presence of multiple vertical partial magnetic fields in a trapezoidal shaped cavity”, *The European Physical Journal Special Topics* 231 (2022) 2761-2771, <https://doi.org/10.1140/epjs/s11734-022-00600-y>
- B. Pekmen Geridonmez, H. F. Oztop, “The effect of inclined periodic magnetic field on natural convection flow of Al<sub>2</sub>O<sub>3</sub>-Cu/water nanofluid inside right isosceles triangular closed spaces”, *Engineering Analysis with Boundary Elements* 141 (2022) 222-234. <https://doi.org/10.1016/j.enganabound.2022.05.009>
- B. Pekmen Geridonmez, H.F. Oztop, “Natural convection in a sinusoidally heated cavity filled with ferrofluid in the presence of partial variable magnetic field”, *International Journal of Numerical Methods & Fluid Flow* 2022 <https://doi.org/10.1108/hff-01-2022-0053>
- Shafqat Hussain, Bengisen Pekmen Geridonmez, “Mixed bioconvection flow of Ag-MgO/water in the presence of oxytactic bacteria and inclined periodic magnetic field”, *International Communications in Heat and Mass Transfer*, 134 (2022) 106015 <https://doi.org/10.1016/j.icheatmasstransfer.2022.106015>.
- B. Pekmen Geridonmez, Hakan F. Oztop, Effects of partial magnetic field in a vented square cavity with aiding and opposing of MWCNT-water nanofluid flows, *Engineering Analysis with Boundary Elements*, 133 (2021) 84-94. <https://doi.org/10.1016/j.enganabound.2021.08.024>
- B. Pekmen Geridonmez, Hakan F. Oztop, Effects of inlet velocity profiles of hybrid nanofluid flow on mixed convection through a backward facing step channel under partial magnetic field, *Chemical Physics*, 540 (2021) 111010. <https://doi.org/10.1016/j.chemphys.2020.111010>.
- B. Pekmen Geridonmez, Hakan F. Oztop, Natural convection in an open ended nanofluid filled cavity with fins in the presence of partial magnetic field and thermal radiation, *Mathematical Methods in the Applied Sciences*, 2021, 1-19. <https://doi.org/10.1002/mma.7234>.
- S. Hussain, M. Jamal, B. Pekmen Geridonmez, Impact of power law fluid and magnetic field on double diffusive mixed convection in staggered porous cavity considering Dufour and Soret effects, *International Communications in Heat and Mass Transfer*, 121 (2021) 105075. <https://doi.org/10.1016/j.icheatmasstransfer.2020.105075>.

- S. Hussain, M. Jamal, B. Pekmen Geridonmez, Impact of fins and inclined magnetic field in double lid-driven cavity with Cu-water nanofluid, International Journal of Thermal Sciences, 161 (2021) 106707. <https://doi.org/10.1016/j.ijthermalsci.2020.106707>.
- B. Pekmen Geridonmez, Hakan F. Oztop, Mixed convection heat transfer in a lid-driven cavity under partial magnetic field, Heat Transfer Engineering 42:10 (2021) 875--887, <https://doi.org/10.1080/01457632.2020.1792622>
- B. Pekmen Geridonmez, Hakan F. Oztop, MHD natural convection in a cavity in the presence of cross partial magnetic fields and Al<sub>2</sub>O<sub>3</sub>-water nanofluid, Computers and Mathematics with Applications, 80 (2020) 2796-2810, <https://doi.org/10.1016/j.camwa.2020.10.003>.
- B. Pekmen Geridonmez, Hakan F. Oztop, Natural convection in a cavity under partial magnetic field applied from different corners, International Communications in Heat and Mass Transfer, 115 (2020) 104575. <https://doi.org/10.1016/j.icheatmasstransfer.2020.104575>.
- B. Pekmen Geridonmez, A new regression based approach to estimate the shape parameter of MQ-RBFs in a free convection problem, ASME-Journal of Computing and Information Science in Engineering, 20:1 (2020) 0011009. <https://doi.org/10.1115/1.4045053>
- B. Pekmen Geridonmez, Hakan F. Oztop, Natural convection in a cavity filled with porous medium under the effect of a partial magnetic field, International Journal of Mechanical Sciences, 161-162 (2019) 105077. <https://doi.org/10.1016/j.ijmecsci.2019.105077>
- B. Pekmen Geridonmez, Magnetic source effect on EG-CuO nanofluid in a semi-annulus using RBFs, International Journal for Computational Methods in Engineering Science and Mechanics, 20:3 (2019) 201--211. <https://doi.org/10.1080/15502287.2019.1604583>
- B. Pekmen Geridonmez, Free convection in a wavy walled cavity with a magnetic source using radial basis functions, ASME-Journal of Heat Transfer, 141:4 (2019) 042501. <https://doi.org/10.1115/1.4042782>
- B. Pekmen Geridonmez, Numerical investigation of ferrofluid convection with Kelvin forces and non-Darcy effects, AIMS Mathematics, 3:1 (2018) 195-210. <http://dx.doi.org/10.3934/Math.2018.1.195>
- B. Pekmen Geridonmez, Numerical simulation of natural convection in a porous cavity filled with ferrofluid, Journal of Thermal Engineering, 4:2 (2018) 1770-1779. <http://dx.doi.org/10.18186/journal-of-thermal-engineering.369169>
- B. Pekmen, Numerical investigation on natural convection in an enclosure with a conducting solid body, Heat Transfer Research, 49:2 (2018) 157—172. <http://dx.doi.org/10.1615/HeatTransRes.2017016351>

- B. Pekmen, RBF-PS solution of the non-Darcy model in a porous medium, Journal of Porous Media, 20:6 (2017) 479-490. <http://dx.doi.org/10.1615/JPorMedia.v20.i6.10>
- B. Pekmen Geridonmez, RBF-DQ solution of natural convection under the effect of a magnetic field in a tilted cavity, Journal of Applied Fluid Mechanics, 10:2 (2017) 499-507. <http://dx.doi.org/10.18869/acadpub.jafm.73.239.27011>
- B. Pekmen Geridonmez, RBF simulation of natural convection in a nanofluid-filled cavity, AIMS Mathematics, 1 (2016) 195-207. <http://dx.doi.org/10.3934/Math.2016.3.195>
- B. Pekmen, M. Tezer-Sezgin, DRBEM solution of MHD flow with magnetic induction and heat transfer, CMES – Computer Modeling in Engineering & Science, 105 (3) (2015) 183-207. [doi:10.3970/cmcs.2015.105.183](https://doi.org/10.3970/cmcs.2015.105.183)
- B. Pekmen, M. Tezer-Sezgin, Numerical solution of buoyancy MHD flow with magnetic potential, International Journal of Heat and Mass Transfer, 71 (2014) 172-182. <https://doi.org/10.1016/j.ijheatmasstransfer.2013.12.029>
- B. Pekmen, M. Tezer-Sezgin, MHD flow and heat transfer in a lid-driven porous enclosure, Computers & Fluids, 89 (2014) 191-199. <https://doi.org/10.1016/j.compfluid.2013.10.045>
- B. Pekmen, M. Tezer-Sezgin, DRBEM solution of incompressible MHD flow with magnetic potential, CMES – Computer Modeling in Engineering & Science, 96:4 (2013) 275-292. [doi:10.3970/cmcs.2013.096.275](https://doi.org/10.3970/cmcs.2013.096.275)
- B. Pekmen, M. Tezer-Sezgin, DRBEM solution of free convection in porous enclosures under the effect of a magnetic field, International Journal of Heat and Mass Transfer, 56 (2013) 454-468. <https://doi.org/10.1016/j.ijheatmasstransfer.2012.09.019>
- B. Pekmen, M. Tezer-Sezgin, Differential quadrature solution of hyperbolic telegraph equation, Journal of Applied Mathematics, Volume 2012, Article ID 924765. <http://dx.doi.org/10.1155/2012/924765>
- B. Pekmen, M. Tezer-Sezgin, Differential quadrature solution of nonlinear Klein-Gordon and sine-Gordon equations, Computer Physics Communications, 183 (2012) 1702-1713. <https://doi.org/10.1016/j.cpc.2012.03.010>

## Proceedings

- S. Hussain, B. Pekmen Geridonmez, “Natural Convection Flow in an Inclined Wavy Porous Medium in the Presence of an Inclined Periodic Magnetic Field” IC-MSQUARE 2023 Conference Proceedings, Springer Mathematical Modeling in Physical Sciences

- B. Pekmen Geridonmez, “Machine learning approach to the temperature gradient in the case of discontinuous temperature boundary conditions in a triangular cavity”, MMSC2022, J. Phys. Conf. Ser. 2514 (2023) 012010.
- B. Pekmen Geridonmez, “RBF-PUM solution of magnetoconvection in a triangular cavity exposed to a uniform magnetic field”, Proceedings of 10th (Online) International Conference on Applied Analysis and Mathematical Modeling (ICAAMM22), July 1-3, 2022, Istanbul-Turkiye, pp 78--83.
- B. Pekmen Geridonmez, “RBF-FD solution of natural convection flow of a nanofluid in a right isosceles triangle under the effect of inclined periodic magnetic field”, ICMASE 2022: Mathematical Methods for Engineering Applications, pp. 13-21, Springer Proceedings in Mathematics & Statistics. <https://doi.org/10.1007/978-3-031-21700-5>.
- B. Pekmen Geridönmez, “Different time schemes with differential quadrature method in convection-diffusion-reaction equations”, ICMASE 2021: Mathematical Methods for Engineering Applications, pp.103-111, Springer Nature. [https://doi.org/10.1007/978-3-030-96401-6\\_9](https://doi.org/10.1007/978-3-030-96401-6_9)
- B. Pekmen Geridönmez, S. M. Eroğlu, “Numerical simulation of mixed convection flow in a cavity filled with  $Fe_3O_4$ -water”, 6th International Conference on Advanced Technology & Sciences (ICAT’Riga) Proceedings, Sep 12-15, 2017, Riga/Latvia, pp. 129-136.
- B. Pekmen Geridönmez, “Numerical solution of magnetoconvection in a ferrofluid-filled cavity”, 6th International Conference on Advanced Technology & Sciences (ICAT’Riga) Proceedings, Sep 12-15, 2017, Riga/Latvia, pp. 108-113.
- B. Pekmen, Y. Ozturk, “RBF-PS solution of the Brinkman-Forchheimer-extended Darcy model in a porous medium”, Advances in Boundary Element & Meshless Techniques XVII, BETEQ 2016, pp.113-118.
- B. Pekmen, “DRBEM Solution of natural convection in an enclosure with a conducting solid body”, AIP Conference Proceedings of ICNAAM 2015, Vol.1738, 480040 (2016). <https://doi.org/10.1063/1.4952276>
- B. Pekmen, M. Tezer-Sezgin, “DRBEM solution of natural convective heat transfer with the Brinkman-Forchheimer-extended Darcy model”, Proceedings of the 14th International Conference on Computational and Mathematical Methods in Science and Engineering, CMMSE 2014, Vol.3 pp.344-353.
- B. Pekmen, M. Tezer-Sezgin, “DRBEM solution for the incompressible MHD equations in terms of magnetic potential”, Advances in Boundary Element Techniques XII, BeTeq 2013 (Boundary Element Technique An International Conference), 16-18 July 2013, Paris, France, pp. 347-352.

- M. Tezer-Sezgin, B. Pekmen, “*DRBEM solution of liquid metal MHD flow in a staggered double lid-driven cavity*”, Advances in Boundary Element Techniques XII, BeTeq 2013 (Boundary Element Technique An International Conference), 16-18 July 2013, Paris, France, pp. 341-346.
- B. Pekmen, M. Tezer-Sezgin, “*Unsteady mixed convection in a porous lid-driven enclosure under a magnetic field*”, International Association for Boundary Element Methods, January 9-11, 2013, Santiago, Chile; pp. 140 – 145.

### Book Chapter

- B. Pekmen, M. Tezer-Sezgin, “*Steady mixed convection in a heated lid-driven square cavity filled with a fluid saturated porous medium*”, Numerical Mathematics and Advanced Applications-ENUMATH 2013, Lecture Notes in Computational Science and Engineering, pp.689-697. [https://dx.doi.org/10.1007/978-3-319-10705-9\\_68](https://dx.doi.org/10.1007/978-3-319-10705-9_68)

### Conference Talks

- B. Pekmen Geridonmez, U. Yirmili, “Numerical investigation on 2D chemotaxis-haptotaxis model of cancer cell invasion of tissue”, Numerical Analysis and Scientific Computing with Applications NASCA23, July 3-6, 2023 (face-to-face).
- U. Yirmili, B. Pekmen Geridonmez, “A numerical treatment to chemotaxis-haptotaxis model of cancer cell invasion of tissue”, Numerical Analysis and Scientific Computing with Applications NASCA23, July 3-6, 2023 (face-to-face).
- B. Pekmen Geridonmez, “Statistical treatment to temperature gradient in case of discontinuous temperature boundary conditions in a triangular cavity”, Workshop on Mathematical Modeling and Scientific Computing (MMSC2022), Technical University of Munich, Munich, Germany, October 4-7, 2022 (Online attendance).
- B. Pekmen Geridonmez, “*Rbf-Pum solution of magnetoconvection in a triangular cavity exposed to a uniform magnetic field*”, ICAAMM 2022 - 10th International Conference on Applied Analysis and Mathematical Modelling, 1-3 July 2022, Istanbul, Turkey (Online)
- B. Pekmen Geridonmez, “*RBF-FD solution of natural convection flow of a nanofluid in a right isosceles triangle under the effect of inclined periodic magnetic field*”, ICMASE 2022 - III. International Conference on Mathematics and its Applications in Science and Engineering, 4-7 July 2022, Bucharest, Romania (Online Attendance)
- B. Pekmen Geridonmez, E. Cengiz, “*Different time schemes with differential quadrature method in convection-diffusion-reaction equations*”, ICMASE 2021 - II. International Conference on Mathematics and Its Applications in Science and Engineering, 1-2 July 2021, Online Conference.
- B. Pekmen Geridonmez, “*A new regression based approach to solve a heat transfer problem*”, ApplMath20 - Tenth Conference on Applied Mathematics and Scientific Computing, September 14<sup>th</sup>-18<sup>th</sup>, 2020, Brijuni, Croatia (Online Attendance).

- B. Pekmen Geridonmez, S. Merve Eroglu, “*RBF solution of free convection in a semi-annulus involving EG-CuO nanofluid*”, ICMS 2018, July 31th-August 4th 2018, Istanbul Maltepe University.
- B. Pekmen Geridonmez, “*Numerical simulation of natural convection in a porous cavity filled with ferrofluid*”, ICAAMM 2017, 3-7 July 2017, Istanbul Gelisim University.
- B. Pekmen Geridonmez, S. Merve Eroglu, “*RBF-DQ solution of natural convection under the effect of a magnetic field in a tilted cavity*”, ICAMA 2016, 11-13 July 2016, Atilim University, Ankara, Turkey.
- B. Pekmen Geridonmez, Y. Ozturk, “*RBF-PS solution of the Brinkman-Forchheimer-extended Darcy model in a porous medium*”, BETEQ 2016, 11-13 July 2016, METU, Ankara, Turkey.
- B. Pekmen Geridonmez, “*RBF solution of natural convection in a nanofluid-filled cavity*”, AIMS 2016, 1-5 July 2016, Orlando, Florida, USA.
- B. Pekmen, “*DRBEM Solution of natural convection in an enclosure with a conducting solid body*”, ICNAAM 2015, September 23th-29th, Rhodes, Greece.
- B. Pekmen, M. Tezer-Sezgin, “*DRBEM solution of natural convection in a porous medium with the Brinkman-Forchheimer-extended Darcy model*”, CMMSE 2014 (14th International Conference on Mathematical Methods in Science and Engineering), 3rd-6th July 2014, Rota, Cadiz - Spain.
- B. Pekmen, M. Tezer-Sezgin, “*Steady mixed convection in a heated lid-driven square cavity filled with a fluid-saturated porous medium*”, ENUMATH 2013 (The tenth European Conference of Numerical Mathematics and Advanced Applications), 26-30 August 2013, Lausanne.
- M. Tezer-Sezgin, B. Pekmen, “*DRBEM solution of full MHD and temperature equations in a lid-driven cavity*”, ENUMATH 2013 (The tenth European Conference of Numerical Mathematics and Advanced Applications), 26-30 August 2013, Lausanne.
- B. Pekmen, M. Tezer-Sezgin, “*DRBEM solution of MHD free convection in a square cavity filled with a porous medium*”, International Conference on Applied and Computational Mathematics, 3-6 October 2012, Institute of Applied Mathematics, METU, Ankara.
- B. Pekmen, M. Tezer-Sezgin, “*DRBEM solution of unsteady MHD free convection in a porous medium*”, FEM-BEM Workshop, May 26th, 2012, Institute of Applied Mathematics, METU.
- B. Pekmen, M. Tezer-Sezgin, “*Numerical solution of unsteady Magnetohydrodynamic flow in a rectangular duct by using differential quadrature method both in time and space*”,



International School on Magnetohydrodynamics and Fusion Applications, 9 – 16 September 2011, ITAP, Turunc, Marmaris, Mugla.

- B. Pekmen, M. Tezer-Sezgin, “*DQM Time – DQM space solution of hyperbolic telegraph equation*”, 24<sup>th</sup> Biennial Conference on Numerical Analysis, University of Strathclyde in Glasgow, Scotland, June 28th - July 1st 2011.

## **Reviewer**

Journals that I reviewed manuscripts are :

- Processes (Mdpi)
- Applied Sciences (Mdpi)
- Sustainability (Mdpi)
- International Journal of Numerical Methods for Heat and Fluid Flow
- International Journal of Mechanical Sciences
- International Journal of Heat and Mass Transfer
- International Communications in Heat and Mass Transfer
- Alexandria Engineering Journal
- Scientia Iranica
- Journal of Brazilian Society of Mechanical Sciences and Engineering
- Journal of Thermal Engineering
- Journal of King Saud University – Science
- CMES - Computer Modeling in Engineering & Sciences

## **Conference and Symposium Organizing**

- ‘9th Ankara Mathematics Days Symposium’ in Atilim University
- ‘12th International Workshop on Dynamical Systems and Applications’ (IWDSA 2013) in Atilim University

## **Commission Duty**

- TEDU - Institutional Research Fund & TEDU - Undergraduate Research Fund Commission in TED University (between February 2021- March 2022)

## **Administrative Duty (Temporary Duty)**

- Coordinator of Applied Data Science Master Program in TED University between May 17th, 2021 - November 12th, 2021

## **Awards**

- 2007-2008 Academic Year METU Graduate Courses Performance Award
- 2013-2014 METU PhD Thesis Award

**Date of Birth** : 01.12.1986