Academic CV

Gülsemay YİĞİT
Bahçeşehir University, Faculty of Engineering and Natural Sciences,
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EDUCATION

- PhD (2012-2019) Yildiz Technical University, Graduate School of Natural and Applied Sciences, Department of Mathematical Engineering, Istanbul, Turkey
- MSc (2010-2012) Yildiz Technical University, Graduate School of Natural and Applied Sciences, Department of Mathematical Engineering, Istanbul, Turkey
- BSc (2006-2010) Eskisehir Osmangazi University, Department of Mathematics, Eskisehir, Turkey

ACADEMIC EXPERIENCE

- Assistant Professor (Mar 2020- Present) Bahçeşehir University, Faculty of Engineering and Natural Sciences, Department of Mathematics, Istanbul, Turkey
- Lecturer in Mathematics (Oct 2013- Mar 2020) Altınbaş University, Faculty of Engineering and Natural Sciences, Department of Basic Sciences, Istanbul, Turkey

RESEARCH INTEREST

- Applied Mathematics
- Numerical Analysis
- Computational Methods
- Partial Differential Equations
- Computational Biology
- Reaction-Diffusion Models
- Pattern Formation
- Cell Motility

GRANTS

- Funded partially by the Newcastle University for the participation of 65th British Applied Mathematics Colloquium, (BAMC2024), Newcastle, United Kingdom, 9-11 April 2024.
- Funded by the Isaac Newton Institute for Mathematical Sciences, for the participation of programme “Mathematics of movement: an interdisciplinary approach to mutual challenges in animal ecology and cell biology” (Isaac Newton Institute for Mathematical Sciences, Cambridge, United Kingdom, December 3 2023 - December 17, 2023)
- Funded by the International Center for Mathematical Sciences (ICMS) for the participation of programme “Mathematics of movement: an interdisciplinary approach to mutual

challenges in animal ecology and cell biology" (International Center for Mathematical Sciences, Edinburgh, United Kingdom, September 3 2022 - September 10, 2022)
- Funded by the South African Staff Development Program for the visit to University of Sussex, Department of Mathematics, Brighton, United Kingdom (September 10, 2022-September 17, 2022)

PUBLICATIONS

- Yigit, G., Sarfaraz, W., Barreira, R., Madzvamuse, A.: A domain-dependent stability analysis of reaction-diffusion systems with linear cross-diffusion on circular domains. *Nonlinear Analysis: Real World Applications,* 77, 104042*,* (2024).
- Yigit, G., Hepson, O.E. Allahviranloo, T.: A computational method for nonlinear Burgers' equation using quartic-trigonometric tension B-splines. *Mathematical Sciences*, 18(1), 17-28 (2024).
- Hepson, O. E., Yiğit, G. : A Numerical Scheme for the Wave Simulations of the Kuramoto-Sivashinsky Model via Quartic-Trigonometric Tension B-spline. *Wave Motion*, 114, 103045 (2022).
- Hepson, O. E., Yigit, G.: Quartic-trigonometric tension B-spline Galerkin method for the solution of the advection-diffusion equation. *Computational and Applied Mathematics*, 40(4), 1-15 (2021).
- Hepson, O. E., Yiğit, G., Allahviranloo, T.: Numerical simulations of reaction–diffusion systems in biological and chemical mechanisms with quartic-trigonometric B-splines. *Computational and Applied Mathematics*, 40(4), 1-23 (2021).
- Yiğit, G., and M. Bayram, "Chebyshev Differential Quadrature for Numerical Solutions o Third-and Fourth-Order Singular Perturbation Problems*", Proceedings of the National Academy of Sciences, India Section A: Physical Sciences,* 90, 429-436 (2020).
- Yiğit, G., and M. Bayram, "Polynomial Based Differential Quadrature for Numerical Solutions of Kuramoto-Sivashinsky Equation", *Thermal Science*, 23(1), S129-S137, (2019).
- Yigit, G., Sahin, A., Bayram, M., "Modeling of Vibration for Functionally Graded Beams", *Open Mathematics*, 14, 661-672, (2016).

BOOK CHAPTERS

- O.E., Hepson, G., Yiğit. Numerical Investigations of Physical Processes for Regularized Long Wave Equation*. Part of the Advances in Intelligent Systems and Computing book series (AISC, volume 1301)*, *Springer, Cham*, pp. 710-720, 2021.
- G., Yiğit, Salahshour, S., Numerical Solution of Fractional Cauchy Reaction-Diffusion Equation by Differential Quadrature. *Part of the Advances in Intelligent Systems and Computing book series (AISC, volume 1301)*, *Springer, Cham*, pp. 725-737, 2021.

CONFERENCE PARTICIPATION AND TALKS

- Presented a talk titled "Spatiotemporal domain-dependent dynamics of a cross-diffusive model in biological pattern generation", at the workshop Networking Event: Empowering Healthcare with Automated Analysis, Bahçeşehir University, 3-4-5 June, İstanbul, Turkey.
- "9th Turkish Woman Mathematicians Society Workshop", W. Sarfaraz, R., Barreira, A., Madzvamuse. "Spatiotemporal dynamics of a cross-diffusive reaction diffusion model for biological pattern formation", Izmir University of Economics, Izmir, Turkey, 3-5 May 2024, pp 23.

- "BAMC2024" G., Yiğit, W. Sarfaraz, R., Barreira, A., Madzvamuse. "Understanding the role of geometry and cross-diffusion in pattern formation", 65th British Applied Mathematics Colloquium, Newcastle University, Newcastle, United Kingdom, 9-11 April 2024, pp 64.
- Presented a talk titled "Analysis of the effects of geometry and cross-diffusion in pattern formation", Mathematics of movement: an interdisciplinary approach to mutual challenges in animal ecology and cell biology Programme, Isaac Newton Institute for Mathematical Sciences, Cambridge, United Kingdom, 7 December 2023. https://www.newton.ac.uk/seminar/41397/
- Participation in programme "Mathematics of movement: an interdisciplinary approach to mutual challenges in animal ecology and cell biology", Isaac Newton Institute for Mathematical Sciences, Cambridge, United Kingdom, 1-19 December 2023.
- "UMS 2023", G., Yiğit, W. Sarfaraz, R., Barreira, A., Madzvamuse. "Iki boyutlu geometriler üzerinde çapraz difüzyonlu reaksiyon-difüzyon sistemlerinin alan bağımlı kararlılık analizi ve nümerik simülasyonları", 35th National Mathematics Symposium 2023, Trakya University, Edirne-Turkey, pp 55.
- Participation in workshop "2023 CompuCell3D Multicell Virtual Tissue Modeling Online Summer School & Hackathon", organized by James Glazier, Indiana University, Bloomington, USA, 31 July-13 August 2023.
- "ICNS 2023", G., Yiğit, W. Sarafaraz, R., Barreira, A., Madzvamuse. "Domain-dependent stability analysis and numerical simulations for a reaction-diffusion system with cross-diffusion on two dimensional geometries", International Conference on Nonlinear Science and Complexity (ICNSC23) July 10-15, 2023, Istanbul, Turkey, pp 89.
- Presented a talk titled "Domain-dependent analysis and simulations of cross-diffusive reaction-diffusion systems on two dimensional geometries" at the Online Mathematical Biology Weekly Seminar Series in Mathematics Department, University of British Columbia, Vancouver, Canada, 27 March 2023.
- Participation in research-in-groups project titled "Formulating new poro-elastic models for nuclei deformation and cell migration through complex non-isotropic environments", supervised by Prof. Anotida Madzvamuse at ICMS Bayes Centre Edinburgh, Scotland, UK, 01-10 September 2022.
- "IDS 2020", O.E., Hepson, G., Yiğit, Numerical Investigations of Physical Processes for Regularized Long Wave Equation. The 4-th International Conference on Intelligent Decision Science İstanbul, Turkey, 07 - 08 August 2020, pp.710-720.
- "IDS 2020", G., Yiğit, Salahshour, S., Numerical Solution of Fractional Cauchy Reaction-Diffusion Equation by Differential Quadrature. The 4-th International Conference on Intelligent Decision Science, İstanbul, Turkey, 07 - 08 August 2020, pp.725-737.
- "ICCMAS 2019", G. Yiğit and M. Bayram, "Numerical Treatment of Linear and Nonlinear Diffusion Equations Based Differential Quadrature", International Conference on Computational Methods in Applied Sciences, Istanbul, Turkey, 12-16 July 2019, pp.138-143.
- "6th Turkish Woman Mathematicians Society Workshop", G. Yiğit and M. Bayram, "Numerical Simulations of Kuramoto-Sivashinsky Equation by Chebyshev Based Differential Quadrature", Konya, Turkey, 26-28 April 2019, pp.36.
- "ICAAMM 2018", G. Yiğit and M. Bayram, "Chebyshev Differential Quadrature for "Quasilinear Hyperbolic Equations", 7th International Conference on Applied Analysis and Mathematical Modeling, Istanbul, Turkey, 20-24 June 2018, pp.82.
- "SciCADE 2017", G. Yiğit, Mustafa Bayram, ''Polynomial Based Differential Quadrature for Numerical Solution of Kuramoto-Sivashinsky Equation'' International Conference on Scientific Computation and Differential Equations, University of Bath, 11-15 September 2017, Bath, United Kingdom, 2017.

- "ICAAMM 2017", G. Yiğit, Mustafa Bayram, ''Chebyshev Differential Quadrature for Advection Diffusion Equation'' International Conference on Applied Analysis and Mathematical Modeling, İstanbul Gelişim University, 03-07 July 2017, İstanbul, Turkey, 2017.
- "ICOME 2017", G. Yiğit, "Numerical Solutions for Nonlinear Advection Problems by Chebyshev Differential Quadrature", International Conference on Mathematics and Engineering, Istanbul, Turkey, 10-12 May 2017, pp.187.
- "ICPAS 2017", G.Yiğit, M. Bayram, "Numerical Solutions for Higher Order Singular Perturbation Problems by Polynomial Based Differential Quadrature", 3rd International Conference on Pure and Applied Sciences, Dubai, UAE, 02-06 February, 2017, page 25.

COURSES

- MAT2043- Linear Algebra with Applications, Fall 2023, Instructor, Course Coordinator
- MAT2045- Numerical Methods for Engineers, Fall 2023, Instructor, Course Coordinator
- MAT2062- Differential Equations, Spring 2023, Summer 2022, Fall 2021, Spring 2022, Instructor, Course Coordinator
- MAT1015-Matematics for Biological Sciences, Fall 2021, Instructor, Course Coordinator
- MAT1051-Calculus 1, Spring 2020, Fall 2020, Fall 2021, Spring 2022, Instructor, Course Coordinator
- MAT1052-Calculus 2, Spring 2020, Spring 2021, Summer 2021, Spring 2024 Instructor, Course Coordinator
- MATH 317-Numerical Analysis, Summer 2019, Fall 2019, Instructor, Course Coordinator
- MATH 155-Mathematics for Health Sciences, Summer 2017, Summer 2018, Fall 2018, Fall 2019, Instructor, Course Coordinator
- MAT 152-Calculus II (TR), Spring 2019, Instructor
- MAT 126- Mathematics for Architecture II (TR), Spring 2019, Instructor
- MATH 125- Mathematics for Architecture I, Fall 2017, Fall 2018, Instructor
- MATH 126- Mathematics for Architecture II, Spring 2018
- MATH 151- Calculus I, Fall 2017, Spring 2017, Summer 2016, Instructor
- MATH 152-Calculus II, Spring 2018, Instructor
- MATH 101- Mathematics for Social Sciences I, Summer 2015, Fall 2016, Instructor
- MATH 102- Mathematics for Social Sciences II, Summer 2016, Spring 2017, Instructor
- MATH 101- Mathematics for Social Sciences I, Fall 2016 Instructor
- MATH 152-Calculus II, Spring 2014, Summer 2014, Spring 2015 Course Assistant
- MATH 101- Mathematics for Social Sciences I, Fall 2014, Fall 2015, Course Assistant
- MATH 102- Mathematics for Social Sciences II, Spring 2014, Spring 2015, Spring 2016, Course Assistant
- MATH 125- Mathematics for Architecture I, Fall 2014, Fall 2015, Course Assistant
- MATH 126- Mathematics for Architecture II, Spring 2014, Spring 2015, Spring 2016 Course Assistant

- MATH 151-Calculus I, Fall 2013, Spring 2013, Fall 2014, Spring 2014, Fall 2016 Course Assistant

ACADEMIC SKILLS

- Programming: MATLAB, Maple, FEniCS, Mathematica, Python
- Tools: LaTeX
- Languages: English (Fluent in spoken and written English), Turkish (Native)

ADDITIONAL

- Member of Turkish Woman Mathematicians Society (TKMD) (2019-Present)
- Member of European Society for Mathematical and Theoretical Biology (ESMTB) (2023-Present)
- Coordinator of Mathematics Courses for Accreditation of Engineering Education (MÜDEK) in Bahcesehir University (2020-Present)
- Turkish Swimming Federation Licensed Swimmer (2021-Present)
- Flexible communication and presentation skills in both verbal and written