Nurdan Kar, Ph.D.

PERSONAL

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EDUCATION

Doctor of Philosophy (Ph.D.) in Mathematics — **Ankara, Türkiye**
Ankara University — *2019 – 2025*

Master of Science (M.Sc.) in Mathematics — **Ankara, Türkiye**
Hacettepe University — *2016 – 2018*

Special Student (during M.Sc. at Hacettepe University) — **Ankara, Türkiye**
Middle East Technical University (METU) — *Spring 2017*

RESEARCH EXPERIENCES

Research Scholar — **MD, USA**
University of Maryland, College Park — *Jan 2023 – Jan 2024*
PhD Thesis Research
Developed Python code to solve a fractional partial differential equation to model glioblastoma growth. Attended the BIOL 708T (Theoretical Ecology) course.

RESEARCH INTERESTS

- Applied Mathematics
- Mathematical Biology (Disease Modeling)
- Stochastic Modeling of Biological Systems

FUNDING AND FELLOWSHIPS

- Centre International de Mathématiques Pures et Appliquées (CIMPA) Grant (€1000 travel grant + accommodation expenses) — *2025*
- TÜBİTAK 2214-A International Research Fellowship for Ph.D. Students ($21600 + travel expenses) — *2022*

FUNDING FOR EVENTS

- Turkish Mathematical Society - MAD Fund for Mathematical Modeling Symposium (25000TL/$650) — *2025*

SOCIETY MEMBERSHIPS

- Society for Industrial and Applied Mathematics (SIAM) — *2025 – present*
- Association for Women in Mathematics (AWM) — *2025 – present*
- Society for Mathematical Biology (SMB) — *2020 – present*

TEACHING AND MENTORING

Instructor **Ankara, Türkiye**
Department of Mathematics, Bilkent University *2024–present*

- **Course Coordinator (MATH 260)**: Managing course content, designing assessments, and ensuring instructional consistency across multiple sections for industrial engineering majors.
- **Courses Taught**:
  - MATH 260 – Introduction to Statistics (Spring 2026; 3 sections)
  - MATH 230 – Probability and Statistics for Engineers (Fall 2025; 3 sections)
  - MATH 106 – Introduction to Calculus II (Spring 2025; 2 sections, Summer 2025; 1 section)
  - MATH 105 – Introduction to Calculus I (Fall 2024; 2 sections)
- Deliver lectures, manage grading, and provide dedicated student support for large, heterogeneous cohorts.
- Hold regular office hours and provide academic advising, mentoring students on research opportunities and career planning.

Mentor **Hybrid**
Directed Reading Program (DRP) Türkiye *Summers 2024–2025*

- Mentored undergraduate students through structured reading and discussion on advanced topics, such as:
  - Mathematical formulations of Waddington's epigenetic landscape (**Bartu Gencer**, Boğaziçi University).
  - Diffusion Tensor Imaging (DTI)-based approaches to modeling anisotropic cancer invasion pathways (**Beyza Nur Korkmaz**, Bursa Technical University).
- Supported students in understanding advanced literature and developing mathematical intuition.
- Assisted students in preparing and delivering presentations at a concluding in-person symposium, and accompanied them during their talks.

PAPERS

- **Kar, N.** (2026). Fractional PDE modeling of glioblastoma spread on BrainWeb MRI images. In preparation.
- **Kar, N.** (2025). A comparative study of hypofractionated and standard fractionated radiotherapy in glioblastoma with two different growth patterns. In preparation.
- **Kar, N.**, Özalp, N. (2024). A fractional mathematical model approach on glioblastoma growth: tumor visibility timing and patient survival. Mathematical Modelling and Numerical Simulation with Applications, 4(1), 66-85. https://doi.org/10.53391/mmnsa.1438916
  - *Research Highlight: Introduced a novel mathematical model for glioblastoma growth.*
- **Kar, N.** (2023). Time-fractional quenching problem: Blow-up of $D_t^\alpha u$ at the quenching point. arXiv: 2306.07508 [math.AP].
  - *Research Highlight: Proved the occurrence of blow-up in the time-fractional term at the quenching point.*

INVITED TALKS

II Encuentro Multidisciplinario de Ciencias Naturales y Exactas: Rosalind Franklin **Online**
Cayetano Heredia University (Peru) *13 Nov 2025*
Talk: Evolution of Mathematical Models of Tumor Growth

TALKS

Centre International de Mathématiques Pures et Appliquées Research School **Havana, Cuba**
University of Havana *10 Jun 2025*
Talk: Reaction-Diffusion Formalism for Glioma Growth

Departmental Seminar **Ankara, Türkiye**
İ.D Bilkent University *7 Apr 2025*
Talk: A Mathematical Model for Tracking Malignancy in the Human Brain

İzmir Mathematics Days VI **İzmir, Türkiye**
Yasar University *12 Sep 2024*
Talk: DTI-Based Mathematical Modeling of Glioma Invasion

Departmental Seminar **Online**
İ.D Bilkent University (Türkiye) *3 Sep 2024*
Talk: Mathematical Modeling of Glioblastoma Growth

Lightning Talks **Online**
DRP Türkiye 2024 *30 Jul 2024*
Talk: On Mathematical Oncology

15th Ankara Mathematics Days **Ankara, Türkiye**
Ankara Hacı Bayram Veli University *23 May 2024*
Talk: A Macroscopic-Scale Fractional Model for Glioblastoma Recurrence Monitoring

9th Workshop of Association for Turkish Women in Maths **İzmir, Türkiye**
İzmir University of Economics *03 May 2024*
Talk: A Fractional Mathematical Model for Macroscopic Dynamics of Glioblastoma Growth

Graduate Seminars III **Ankara, Türkiye**
Hacettepe University *23 Feb 2024*
Talk: Examining Glioblastoma Dynamics Through a Fractional Mathematical Modeling Perspective

Departmental Seminar (Host: Prof. Sridhar Hannenhalli) **MD, USA**
National Cancer Institute *03 Oct 2023*
Talk: Tracking Glioblastoma Recurrence: A Novel Prognostic Mathematical Model Approach

Monroe Martin Talks **MD, USA**
University of Maryland *31 Mar 2023*
Talk: Time-Fractional Order Modeling of Brain Tumor Dynamics

İzmir Mathematics Days I **İzmir, Türkiye**
Yasar University *27 Jun 2018*
Talk: Bäcklund Transformations of Nonlinear Partial Differential Equations

CONFERENCE ATTENDANCE (Selected)

SMB 2020 Annual Meeting **Online**
The Society of Mathematical Biology *17 – 20 Aug 2020*
Attendee

The 8th International Workshop on Differential Equations and Applications **İzmir, Türkiye**
Dokuz Eylül University *02 – 04 Jun 2017*
Attendee

ACADEMIC EXPERIENCES

Participant & Speaker (Grant Awardee) **Havana, Cuba**
CIMPA & University of Havana *9 – 20 Jun 2025*
Research School
Attended lectures on mathematical models in biology and delivered a talk.

Participant **Online**
Fields Institute (Canada) *Sep 2024 – Dec 2024*
Thematic Program in Mathematical Oncology
Attended graduate courses in mathematical oncology.

Participant **Ankara, Türkiye**
Association for Turkish Women in Maths & METU *Jun 2024 – Jul 2024*
Summer School
Attended Numerical Analysis lecture covering topics such as Interpolation, Least Square Problem, Finite Difference Methods and Finite Element Method, held at Middle East Technical University (METU).

NOTABLE SKILLS

- **Grant Writing**
  Successfully secured the TÜBİTAK 2214-A International Research Fellowship for Ph.D. Students for a one-year research project at the University of Maryland, MD, USA.
- **Project Management**
  Independently developed and executed the research project, which was supported by TÜBİTAK.

COMPUTER SKILLS

- Technical LaTeX, MS Office (Word/Excel/PowerPoint), Canva
- Programming Python (NumPy, SciPy, Matplotlib), Maple
- Environments Docker, Git, VS Code, Google Colab, Jupyter
- Bioinformatics Data analysis, Data visualization

SERVICE AND SCIENCE OUTREACH

- **Mentor** | Directed Reading Program Türkiye (2025)
- **Organizer** | Mathematical Modeling Symposium (2025)
- **Co-Coordinator** | Young Mathematicians Research Symposia Platform (2024 – present)
- **Founder** | Initiated and led the founding of the Young Mathematicians Research Symposia Platform in Türkiye with the support of Prof. Aslı Pekcan Yıldız from Hacettepe University.
- **Mentor** | Directed Reading Program Türkiye (2024)

LANGUAGE SKILLS

Turkish (Native), English (Advanced), French (Basic – Developing)

REFERENCES

Available on request