

Shayan Dodge

Date of birth: Jun 1, 1995

Place of Birth: Tehran, Iran



(+39) 346 4770928
dodgeshayan@gmail.com; shayan.dodge@ing.unipi.it
Pisa/Italy
www.linkedin.com/in/shayan-dodge-441453204
[Shayan Dodge \(0000-0002-8323-2290\) - My ORCID](https://orcid.org/0000-0002-8323-2290)
[Shayan Dodge - Google Scholar](https://scholar.google.com/citations?user=0000000283232290&hl=en&oi=ao)

Education

Ph.D. in Electrical Engineering

University of Pisa (DESTEC)

Pisa, Italy

Research Focus: Computational and machine learning applications in electromagnetics.
Expected graduation year 2027

Sep 2024- Present

M.Sc. in Plasma Physics

Shahid Beheshti University (Laser and Plasma Research Institute)

Tehran, Iran

Thesis Title: Simulation of Argon Plasma Jet Interaction with Skin by Numerical Method Finite Difference Time Domain (FDTD) method.

Thesis grade: Excellent

Principal supervisor: Professor. Babak Shokri

Overall GPA: 18.27/20 (3.87/4), First-Class Honors

Notable selected courses: Electrodynamics (18/20), Numerical Electrodynamics (19/20)

Sep 2017- Feb 2020

B.Sc. in Physics

Kharazmi University (Department of Physics)

Tehran, Iran

Overall GPA: 18.46/20 (3.98/4), First-Class Honors

Oct 2013 - Jun 2017

Notable selected courses: Electromagnetics II (19/20), Applied Computer Physics (20/20), Optics (19.25/20), Applied Optics (19.5/20), Spectroscopy (19/20), Modern Physics (19.75/20), Statistical Mechanics (19/20)

Professional Experience

Research Fellow

University of Pisa (DESTEC)

Pisa, Italy

1. Forecast of the Effects of Lightning IN Electrical Systems ([FELINES](#))

Jan 2024 – Jan 2025

2. Stochastic electromagnetic modeling and deep learning for an effective and personalized transcranial magnetic stimulation ([STEM-DEEP](#))

Jan 2025 - Present

Research Interest

Computational Electromagnetics	Artificial Intelligence (AI)	Bioelectromagnetics
Finite Difference Time Domain Method (FDTD)	Machine Learning (ML)	Transcranial Magnetic Stimulation (TMS)
Finite Element Method (FEM)	Deep Learning (DL)	Microwave cancer therapy (Hyperthermia)
Boundary Element Method (BEM)	Physics Informed Neural Network (PINN)	Medical applications of cold plasma
Plasma Modeling	ML-based Electromagnetic Modeling	
EM wave plasma interactions		
Kinetic theory of discharge		

Honors and Awards

- **Research Grant:** "Application of Machine Learning to Electromagnetism Problems", **2024 – 2026**
DESTEC, University of Pisa.
- **Ranked 1st** among Plasma Physics graduates at Shahid Beheshti University. **2020**
- **Full tuition-waiving** award for M.Sc. program, Shahid Beheshti University. **2017 – 2020**
- **Ranked 1st** among all the undergraduates of the Physics Department, Kharazmi University. **2017**
- **Full tuition-waiving** award for B.Sc. program, Kharazmi University. **2013 – 2017**
- **Top 1.5%** in Iran's BSc National Entrance Exam among 251,000. **2013**

Research Projects

- [1] Forecast of the Effects of Lightning IN Electrical Systems (FELINES), Financed under the **Jan 2024 - Present**
Project PRIN 2022, DESTEC, University of Pisa
- [2] Stochastic Electromagnetic Modeling and Deep Learning for an Effective and Personalized Transcranial Magnetic Stimulation (STEM-DEEP), Financed under the **Jan 2024 - Present**
Project PRIN 2022, DESTEC, University of Pisa

Extracurricular Activity

- **Teaching**
 - Teaching Mathematics and Physics to university students (Freelance) **2014 - 2024**
 - Teaching MATLAB, Python, and C++ Programming languages **2016 - 2024**
- **Physics Association of Kharazmi University** **2013 - 2015**
 - Committee Member of the Physics Association, Kharazmi University.

Computer Skills

- **Programming Languages:** Python, C++, MATLAB
- **ML and DL Frameworks:** TensorFlow, PyTorch, JAX, scikit-learn, MATLAB Deep Learning Toolbox
- **Data Analysis and Visualization:** Pandas, NumPy, Matplotlib
- **GPU Programming and Parallel Processing:** TensorFlow with GPU, MATLAB Parallel Processing Toolbox
- **Version Control:** Git, GitHub, Docker
- **Other Tools:** Jupyter Notebooks, Anaconda
- **Simulation Software:** CST Studio, Mathematica

Languages

- **English** (C1)
- **Persian** (Native)

Publications

• Journal Articles

- [1] Formisano, A., **Dodge, S.**, & Barmada, S. (2025). A Comparison of Machine Learning and Classical Numerical Approaches for the Resolution of Electromagnetics Problems. IET Science, Measurement & Technology, 19(1), e70034.
- [2] Barmada, S., **Dodge, S.**, & Formisano, A. (2025). Weak Formulation for Physics-Informed Neural Networks in the Resolution of Analysis Problems in Electromagnetics. IEEE Transactions on Magnetics.
- [3] Cosentino, G., Zaffina, C., Zoccola, C., Fresia, M., Merli, S., Mauramati, S., Bertino, G., Todisco, M., **Dodge, S.**, Barmada, S. and Alfonsi, E. & Tassorelli, C. (2025). Unilateral EMG-Guided Botulinum Toxin for Retrograde Cricopharyngeus Dysfunction: A Prospective Clinical and Neurophysiological Study. Toxins, 17(9), 458.

- [4] Barmada, S., Dodge, S., Brignone, M., Nicora, M., & Procopio, R. (2025). [Relating transmission line overvoltages and lightning location: a machine learning-based procedure](#). COMPEL-The international journal for computation and mathematics in electrical and electronic engineering.
- [5] Dodge, S., Barmada, S., & Formisano, A. (2025). [A STacked Adaptive Residual PINN \(STAR-PINN\) Approach to 2D Time-Domain Magnetic Diffusion in Nonlinear Materials](#). IEEE Access.
- [6] Dodge, S., Fontana, N., Mognaschi, M. E., Canicattì, E., & Barmada, S. (2025). [A Deep Learning Based Prediction of Specific Absorption Rate Hot-Spots Induced by Broadband Electromagnetic Devices](#). IET Science, Measurement & Technology, 19(1), e70009.
- [7] Dodge, S., Nicora, M., Barmada, S., Brignone, M., Procopio, R., & Tucci, M. (2025). [A deep learning-based lightning location system](#). Electric Power Systems Research, 242, 111437.
- [8] Sekehravani, E. A., Dodge, S., Barmada, S., Brignone, M., Formisano, A., Mestriner, D., ... & Procopio, R. (2025). [Preliminary Breakdown Pulses \(PBP\): A review on available data and models](#). Electric Power Systems Research, 242, 111463.
- [9] Barmada, S., Dodge, S., Tucci, M., Formisano, A., Di Barba, P., & Mognaschi, M. E. (2024). [A Novel Hybrid Boundary Element–Physics Informed Neural Network Method for Numerical Solutions in Electromagnetics](#). IEEE Access.
- [10] Niknam, A. R., Dodge, S., Hajian, M., & Ansari, M. A. (2024). [Characterization of microwave heating for hyperthermia cancer treatment](#). Waves in Random and Complex Media, 34(1), 211-225.
- [11] Dodge, S., Shafiee, M., & Shokri, B. (2022). [Application of GPU-accelerated FDTD method to electromagnetic wave propagation in plasma using MATLAB Parallel Processing Toolbox](#). arXiv preprint arXiv:2211.05647.

- Conference Papers

- [12] Dodge, S., Shafiee, M., & Shokri, B. (2021). [1-D numerical characterization of the electromagnetic wave propagation in plasma using the kinetic theory of discharge and finite difference time domain method](#). Proceedings of the 8th Conference on Engineering and Physics of Plasma.
- [13] Dodge, S., Shafiee, M., Akbaripoor, M., & Shokri, B. (2019). [Comparison of electromagnetic wave propagation with 1D-FDTD in the modeled plasma by Maxwellian and Druyvesteyn electron distribution function at the initial moment](#). Proceedings of the 7th Conference on Engineering and Physics of Plasma.

Peer Review

[1] IEEE Transactions on Magnetics (1)	2025
[2] Optics express (2)	2025
[3] Franklin open (1)	2025
[4] Physics of plasmas (6)	2024 - 2025
[5] The Applied Computational Electromagnetics Society (2)	2022 - 2025
[6] Waves in Random and Complex Media (2)	2021

References

Prof. Nunzia Fontana	Department of DESTEC, Pisa University, Pisa, Italy	nunzia.fontana@unipi.it
Prof. Sami Barmada	Department of DESTEC, Pisa University, Pisa, Italy	sami.barmada@unipi.it