

<div> <div> <h1>Shayan Dodge</h1> <div> <div>Date of birth: Jun 1, 1995</div> <div>Place of Birth: Tehran, Iran</div> </div> </div> <div> <div> <div>+39) 346 4770928</div> <div>dodgeshayandodge@gmail.com; shayan.dodge@ing.unipi.it</div> <div>Pisa/Italy</div> <div> www.linkedin.com/in/shayan-dodge-441453204 </div> <div>Shayan Dodge (0000-0002-8323-2290) - My ORCID</div> <div>Shayan Dodge - Google Scholar</div> </div> </div> </div>		
Education		
<div> <div> <div>Ph.D. in Electrical Engineering</div> <div> <div>University of Pisa (DESTEC)</div> <div> <div>Research Focus: Computational and machine learning applications in electromagnetics.</div> <div>Expected graduation year 2027</div> </div> </div> <div> <div>Pisa, Italy</div> <div>Sep 2024- Present</div> </div> </div> <div> <div> <div>M.Sc. in Plasma Physics</div> <div> <div>Shahid Beheshti University (Laser and Plasma Research Institute)</div> <div> <div>Thesis Title: Simulation of Argon Plasma Jet Interaction with Skin by Numerical Method Finite Difference Time Domain (FDTD) method.</div> <div>Thesis grade: Excellent</div> <div>Principal supervisor: Professor. Babak Shokri</div> <div>Overall GPA: 18.27/20 (3.87/4), First-Class Honors</div> <div>Notable selected courses: Electrodynamics (18/20), Numerical Electrodynamics (19/20)</div> </div> </div> <div> <div>Tehran, Iran</div> <div>Sep 2017- Feb 2020</div> </div> </div> <div> <div> <div>B.Sc. in Physics</div> <div> <div>Kharazmi University (Department of Physics)</div> <div> <div>Overall GPA: 18.46/20 (3.98/4), First-Class Honors</div> <div>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)</div> </div> </div> <div> <div>Tehran, Iran</div> <div>Oct 2013 - Jun 2017</div> </div> </div> </div> </div></div>		
Professional Experience		
<div> <div> <div>Research Fellow</div> <div> <div>University of Pisa (DESTEC)</div> <div> <div> <div>1. Forecast of the Effects of Lightning IN Electrical Systems (<u>FELINES</u>)</div> <div>2. Stochastic electromagnetic modeling and deep learning for an effective and personalized transcranial magnetic stimulation (<u>STEM-DEEP</u>)</div> </div> </div> <div> <div>Pisa, Italy</div> <div> <div>Jan 2024 – Jan 2025</div> <div>Jan 2025 - Present</div> </div> </div> </div> </div> </div>		
Research Interest		
<div>Computational Electromagnetics</div> <div> <div>Finite Difference Time Domain Method (FDTD)</div> <div>Finite Element Method (FEM)</div> <div>Boundary Element Method (BEM)</div> <div>Plasma Modeling</div> <div>EM wave plasma interactions</div> <div>Kinetic theory of discharge</div> </div>	<div>Artificial Intelligence (AI)</div> <div> <div>Machine Learning (ML)</div> <div>Deep Learning (DL)</div> <div>Physics Informed Neural Network (PINN)</div> <div>ML-based Electromagnetic Modeling</div> </div>	<div>Bioelectromagnetics</div> <div> <div>Transcranial Magnetic Stimulation (TMS)</div> <div>Microwave cancer therapy (Hyperthermia)</div> <div>Medical applications of cold plasma</div> </div>

Honors and Awards	
<ul style="list-style-type: none"> 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] <u>Forecast of the Effects of Lightning IN Electrical Systems (FELINES), Financed under the Project PRIN 2022, DESTEC, University of Pisa</u>	Jan 2024 - Present
[2] <u>Stochastic Electromagnetic Modeling and Deep Learning for an Effective and Personalized Transcranial Magnetic Stimulation (STEM-DEEP), Financed under the Project PRIN 2022, DESTEC, University of Pisa</u>	Jan 2024 - Present
Extracurricular Activity	
<ul style="list-style-type: none"> Teaching <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Committee Member of the Physics Association, Kharazmi University. 	
Computer Skills	
<ul style="list-style-type: none"> 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	
<ul style="list-style-type: none"> English (C1) Persian (Native) 	
Publications	
<ul style="list-style-type: none"> Journal Articles <ul style="list-style-type: none"> [1] Formisano, A., Dodge, S., & Barmada, S. (2025). <u>A Comparison of Machine Learning and Classical Numerical Approaches for the Resolution of Electromagnetics Problems</u>. IET Science, Measurement & Technology, 19(1), e70034. [2] Barmada, S., Dodge, S., & Formisano, A. (2025). <u>Weak Formulation for Physics-Informed Neural Networks in the Resolution of Analysis Problems in Electromagnetics</u>. 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). <u>Unilateral EMG-Guided Botulinum Toxin for Retrograde Cricopharyngeus Dysfunction: A Prospective Clinical and Neurophysiological Study</u>. Toxins, 17(9), 458. 	

<p>[4] Barmada, S., Dodge, S., Brignone, M., Nicora, M., & Procopio, R. (2025). <u>Relating transmission line overvoltages and lightning location: a machine learning-based procedure</u>. COMPEL-The international journal for computation and mathematics in electrical and electronic engineering.</p> <p>[5] Dodge, S., Barmada, S., & Formisano, A. (2025). <u>A STacked Adaptive Residual PINN (STAR-PINN) Approach to 2D Time-Domain Magnetic Diffusion in Nonlinear Materials</u>. IEEE Access.</p> <p>[6] Dodge, S., Fontana, N., Mognaschi, M. E., Canicattì, E., & Barmada, S. (2025). <u>A Deep Learning Based Prediction of Specific Absorption Rate Hot-Spots Induced by Broadband Electromagnetic Devices</u>. IET Science, Measurement & Technology, 19(1), e70009.</p> <p>[7] Dodge, S., Nicora, M., Barmada, S., Brignone, M., Procopio, R., & Tucci, M. (2025). <u>A deep learning-based lightning location system</u>. Electric Power Systems Research, 242, 111437.</p> <p>[8] Sekehravani, E. A., Dodge, S., Barmada, S., Brignone, M., Formisano, A., Mestriner, D., ... & Procopio, R. (2025). <u>Preliminary Breakdown Pulses (PBP): A review on available data and models</u>. Electric Power Systems Research, 242, 111463.</p> <p>[9] Barmada, S., Dodge, S., Tucci, M., Formisano, A., Di Barba, P., & Mognaschi, M. E. (2024). <u>A Novel Hybrid Boundary Element–Physics Informed Neural Network Method for Numerical Solutions in Electromagnetics</u>. IEEE Access.</p> <p>[10] Niknam, A. R., Dodge, S., Hajian, M., & Ansari, M. A. (2024). <u>Characterization of microwave heating for hyperthermia cancer treatment</u>. Waves in Random and Complex Media, 34(1), 211-225.</p> <p>[11] Dodge, S., Shafiee, M., & Shokri, B. (2022). <u>Application of GPU-accelerated FDTD method to electromagnetic wave propagation in plasma using MATLAB Parallel Processing Toolbox</u>. arXiv preprint arXiv:2211.05647.</p>														
<p>• Conference Papers</p> <p>[12] Dodge, S., Shafiee, M., & Shokri, B. (2021). <u>1-D numerical characterization of the electromagnetic wave propagation in plasma using the kinetic theory of discharge and finite difference time domain method</u>. Proceedings of the 8th Conference on Engineering and Physics of Plasma.</p> <p>[13] Dodge, S., Shafiee, M., Akbaripoor, M., & Shokri, B. (2019). <u>Comparison of electromagnetic wave propagation with 1D-FDTD in the modeled plasma by Maxwellian and Druyvesteyn electron distribution function at the initial moment</u>. Proceedings of the 7th Conference on Engineering and Physics of Plasma.</p>														
<p>Peer Review</p> <table border="1"> <tr> <td>[1] IEEE Transactions on Magnetics (1)</td> <td>2025</td> </tr> <tr> <td>[2] Optics express (2)</td> <td>2025</td> </tr> <tr> <td>[3] Franklin open (1)</td> <td>2025</td> </tr> <tr> <td>[4] Physics of plasmas (6)</td> <td>2024 - 2025</td> </tr> <tr> <td>[5] The Applied Computational Electromagnetics Society (2)</td> <td>2022 - 2025</td> </tr> <tr> <td>[6] Waves in Random and Complex Media (2)</td> <td>2021</td> </tr> </table>			[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
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<p>References</p> <table border="1"> <tr> <td>Prof. Nunzia Fontana</td> <td>Department of DESTEC, Pisa University, Pisa, Italy</td> <td>nunzia.fontana@unipi.it</td> </tr> <tr> <td>Prof. Sami Barmada</td> <td>Department of DESTEC, Pisa University, Pisa, Italy</td> <td>sami.barmada@unipi.it</td> </tr> </table>			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						
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