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Engineering & Scientific Consulting

Yulia Malkova, Ph.D.

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Professional Profile

Dr. Malkova's expertise covers many aspects of electrical engineering and applied physics. Built on primary expertise in robotics, scientific modeling, and thermal/cold plasma applications, her experience and knowledge extend into power circuits, control theory, device prototyping, and data science. Dr. Malkova is fluent in finite element analysis and is proficient with tools such as MATLAB Simulink, Ansys, COMSOL, and programming languages such as MATLAB, Python, and LabVIEW. She also has experience with CAD, image processing, and design software, including SOLIDWORKS and FIJI/ImageJ software, as well as significant hands-on experience evaluating medical devices and sterilization instruments. At Exponent, she applies her expertise to help clients with various tasks ranging from technical litigation support to product development and computational modeling.

Prior to joining Exponent, Dr. Malkova worked as a machine learning engineer at Chubb. Her focus was Natural Language Processing (NLP), where the main tasks were to transform raw data, perform A/B testing, conduct prompt engineering and fine-tune customized models, and work with Microsoft Azure Cloud.

She completed her Ph.D. in Electrical Engineering at Drexel University, where she developed a robotically assisted surgical (RAS) device to control and manipulate an untethered miniature device in soft tissue under magnetic field influence—this involved, for example, creating a control system using real-time tracking and computer vision.

Academic Credentials & Professional Honors

Ph.D., Electrical Engineering, Drexel University, 2022

M.S., Physics, Thermonuclear Synthesis Physics, National Research Nuclear University, 2015

B.Sc., Physics, Nuclear and Particle Physics, National Research Nuclear University, 2013

Prior Experience

Machine Learning Engineer, Chubb, Jersey City, NJ, 2022-2023

Graduate Research Assistant, Drexel University, Philadelphia, PA, 2017-2022

Graduate Teaching Assistant, Drexel University, Philadelphia, PA, 2017-2022

Independent Consultant (Contract), SONY, Philadelphia, PA, 2018-2019

Technical Consultant (Contract), BOVIE Medical Corp., Camden, NJ, 2017

Professional Affiliations

Institute of Electrical and Electronics Engineers (IEEE) – Member

Drexel Society of Women engineers - Member

Publications

Malkova Y., Ran S., Vainchtein D., Friedman G. "Model and Parameter Identification of Soft Tissue Response to a Movement of Remotely Navigated Magnetic Sphere", Journal of the Mechanical Behavior of Biomedical Materials, Volume 126, 2022,105040, ISSN 1751-6161

Y. Malkova, S. Ran, G. Friedman "Model of Magnetic Spherical Micro-Robot Motion in Soft Media", (EECSS'21) Prague, Czech Republic Virtual Conference - July 2021, ICBES 111

Malkova Y., Orlov Y., "Estimation of charged particles influence on the explosion of DT-target in thermonuclear reactor chamber", Keldysh Institute preprints, 2015, 009, 20 pp.

Y. Malkova, M. Y. Zhu, S. Smith, A. Fridman, and V. Miller, "Effect of Nanosecond Pulsed Atmospheric Pressure Dielectric Barrier Discharges on Immune Cell-Mediated Wound Healing," 2017 IEEE International Conference on Plasma Science (ICOPS), Atlantic City, NJ, 2017, pp. 1-1

N. Diamond, P. Ranieri, Y. Malkova, A. Lin, G. Fridman, A. Fridman, M. Zhu and S. Smith, Vandana Miller, "Nanosecond-Pulsed Dielectric Barrier Discharge Plasma Enhanced Immune Response for Wound Healing", ISPC-conference.