Appendix 7
to protocol of absentee voting by the Organizing Committee of the International Olympiad of the Association "Global Universities" No. 1–3 dated 10.06.2024

FURLETOV YURY MIKHAILOVITCH. Research profile (portfolio) of potential research supervisor of post-graduate track participants in the Open Doors: Russian Scholarship Project

UNIVERSITY	**MOSCOW POLYTECHNIC UNIVERSITY (Moscow Polytech)**
Level of English proficiency	Fluent
Educational program and field of the educational program for which the applicant will be accepted	2.9.5 Exploitation of transportation vehicles (Vehicle Operation Engineering) 2.5.11 Land transport and technological means and complexes (Land Vehicles)
List of research projects of the potential supervisor	• Research and development work "Open automobile platform for research and testing of autonomous vehicles technologies", MADI, Ministry of Science and Education of the Russian Federation, 2015-2017. • Research and development work "Development of autonomous driving system for S-Class Mercedes Benz" (aDDa Project), TU Darmstadt, Daimler AG, 2017-2022. • Research and development work "Development of sound processing system for autonomous driving", 2017-2022. • Research into implementation of technologies based on import phase-out in "Transport Engineering", "MADI" center for road engineering, "OOO `MSK` CSA (A)" certification authority, 2022. • Research and development work "Independent suspension of a prospective passenger platform", Moscow Polytechnic University, KAMAZ research center, 2023. • Research and development work "Development of driving quality and safety monitoring system (scoring system) based on the onboard systems data, GNSS and accelerometer", "ITMO" advanced engineering school, PAO "Tatneft", 2023-2024. • Research and development work "Development of floor-mounted clamp-truck autonomous driving system for tires factory", "ITMO" advanced engineering school, PAO "Nizhnekamskmashina", 2023-2024. • Research and development work "Developing a mathematical model of chassis operation (transmission, running gear, controlling mechanisms) in static and dynamic condition based on the digital twin of the passenger car platform", Moscow Polytechnic University, Ministry of Science and Higher Education of the Russian Federation, 2023-2025.
List topics offered for prospective research	• Development of methods and algorithms for noisy sound signal filtering. • Development of requirements, virtual and field test methods for sensor equipment and software for the autonomous vehicles in connection to the intellectual transportation environment. • Development of methods and algorithms for acoustic data fusion in connection to the intellectual transportation system.

- Development of an improved sensor setup for autonomous vehicle perception systems.
- Development of vehicle predictive diagnostics and technical condition monitoring based on audio data.
- Application of acoustic signal processing algorithms to smart city systems (V2X).
- Development of a road surface detection system based on audio data.

2.02.01 Automation & control systems
(Автоматизированные системы управления)

Research supervisor:
Furletov Yury Mikhailovitch,
Dr.-Ing. (equivalent to a PhD), The Technical University of Darmstadt (Germany)

Supervisor's research interests

Autonomous driving systems, advanced driver assistance systems (ADAS), audio signal processing systems and vehicle remote diagnostics and technical condition monitoring systems.

Research highlights

Using unique technologies, interaction with researchers and research centers around the world, financial support to post-graduates, and etc.

Supervisor`s specific requirements

Preferably: Python, C++, ML, Matlab, driver's license.

Supervisor's main publications

Publications (Web of Science, Scopus, RSCI) in the last five years.

1. Y. Furletov, V. Willert and J. Adamy, "Auditory Scene Understanding for Autonomous Driving," 2021 IEEE Intelligent Vehicles Symposium (IV), Nagoya, Japan, 2021, pp. 697-702, doi: 10.1109/IV48863.2021.9575964.
2. Y. M. Furletov, A. M. Ivanov, S. S. Shadrin and M. A. Toporkov, "Sound Source Direction of Arrival Estimation for Autonomous Driving Applications," 2022 Intelligent Technologies and Electronic Devices in Vehicle and Road Transport Complex (TIRVED), Moscow, Russian Federation, 2022, pp. 1-5, doi: 10.1109/TIRVED56496.2022.9965523.
3. V.-T. Tran, W.-H. Tsai, Y. Furletov, and M. Gorodnichev, "End-to-End Train Horn Detection for Railway Transit Safety," Sensors, vol. 22, no. 12, p. 4453, Jun. 2022, doi: 10.3390/s22124453. (Q1)
4. Zavatsky, A.M.; Keller, A.V.; Shadrin, S.S.; Makarova, D.A.; Furletov, Y.M. Development of an Electric All-Wheel-Drive Simulation Model Used to Test Torque Distribution Algorithms. Energies 2023, 16, 7144. https://doi.org/10.3390/en16207144 (Q1)
5. Klimov, A.V.; Ospanbekov, B.K.; Keller, A.V.; Shadrin, S.S.; Makarova, D.A.; Furletov, Y.M. Research into the Peculiarities of the Individual Traction Drive Nonlinear System Oscillatory Processes. World Electr. Veh. J. 2023, 14, 316. https://doi.org/10.3390/wevj14110316