VALERIA A. DEMAREVA

University	National Research Lobachevsky State University of Nizhny Novgorod
Level of English proficiency	C1
Educational program and field of the educational program for which the applicant will be accepted	5.12. Cognitive Sciences 5.12.1. Interdisciplinary studies of cognitive processes
List of research projects of the potential supervisor (participation/leadership)	- Development of an early stress identification tool (Russian Science Foundation, 2025-2026 № 25-28-20479) - Development of a prototype driver vigilance monitoring system using heart rate and eye movement analysis (Government grant of Nizhny Novgorod Region in the field of science, technology, and engineering, 2024 № 316-01-23-175/24) - Smart sport: development of a prototype kit for monitoring condition (based on heart rate) during workouts (Government grant of Nizhny Novgorod Region for young scientists, 2023 № 316-06-16-112a/23) - Drowsiness detector based on heart rate (Russian Science Foundation, 2022–2023 № 22-28-20509) - Online functional state detector for optimizing work-rest regime of operator (Government grant of Nizhny Novgorod Region in the field of science, technology, and engineering, 2022 № 316-06-16-15a/22 - Psychophysiological markers of epistemic state change (in the context of online learning) (President of the Russian Federation grant for state support of young Russian PhD candidates, 2021–2022 № MK-6208.2021.2) - Development of neuroheadset for monitoring human condition in phobia treatment (Government grant of Nizhny Novgorod Region for young scientists, 2021 № 316-06-16-62a/21) - Psychophysiological mechanisms of reading: universal effects and language and competence-dependent effects (Russian Foundation for Basic Research, 2018–2020 № 18-013-01169)
List of the topics offered for the prospective scientific research	Usability research, neuromarketing and focus groups. Study of markers of emotional and cognitive response to products and advertising elements. Exploring human-operator states. A search for markers of the cognitive state of the human operator. Search for markers of the emotional state of the human operator. Development of systems for monitoring the human operator's state. Search for common markers of optimal and extreme states of a human operator. Study of human states in sports activities. Vocational guidance of children and adults using VR and AR. Development and testing of educational platforms using VR and AR. Gamification of education. Exploring the effectiveness of implementing game-based practices in education. Analysing human-robot interaction using VR and AR. Psycholinguistics and bilingualism. Ecological validity of competency-based tests. Linguistic indicators of foreign language proficiency. Organising and structuring linguistic databases. Research of language acquisition in the classroom-lesson system with the help of different support systems (textbooks, tutors, etc.).

	Research on incidental language learning processes. Research of speech generation and perception. Development of diagnostic tools. Study of reading skills and factors accompanying successful development of a reading skill. Study of the acquisition and mastery of professional vocabulary. Communication in the teacher's work. Academic writing. Gamification in linguistics. New methods of lie detection.
 Research supervisor: Valeria A. Demareva Candidate of Psychological Sciences (Institute of Psychology Russian Academy of Sciences)	**Education and psychology** **Supervisor's research interests** Exploring the process of interaction between humans and virtual environments. Study of the human condition by objective methods such as eye-tracking, electroencephalography, heart rate variability, skin galvanic response. **Research highlights** The postgraduate student's work will be carried out (depending on the topic chosen) using: • eye tracker goggles to record eye movements during free human behaviour, • wireless heart rate sensors to record the state of the body during different activities, • sensors for polygraphy to record multiple physiological signals simultaneously, • a car simulator with an augmented reality helmet, • a special room with a Gesell mirror and cameras/dictaphones to monitor focus groups, • a soundproof booth for recording stimuli/speech, • a stationary encephalograph to record brain rhythms under different conditions, • a neuroheadset for mobile EEG recording and brain training under different scenarios, • a lie detector, • a virtual reality helmet. **Supervisor's specific requirements** • knowledge of basic methods of psychophysiology, • skills of working with statistical packages, • ability to work in R, Python, • good command of English/French. **Supervisor's main publications** 1. Laptev P., Demareva V.A., Litovkin S., Kostuchenko E., Shelupanov A. Machine learning-based detection of alcohol intoxication through speech analysis: a comparative study of AI models // European Physical Journal: Special Topics. 2025. P. 1-11. https://doi.org/10.1140/epjs/s11734-025-01508-z 2. Demareva, V., Zayceva, I., Viakhireva, V., Zhukova, M., Selezneva, E., Tikhomirova, E. (2023). Home-Based Dynamics of Sleepiness-Related Conditions Starting at Biological Evening and Later (Beyond Working). Int. J. Environ. Res. Public Health 2023, 20, 6641. https://doi.org/10.3390/ijerph20176641

	3. Demareva V. The Dynamics of Heart Rate Asymmetry and Situational Sleepiness from Evening to Night: The Role of Daytime Sleepiness. Biology 2024, 13, 794. https://doi.org/10.3390/biology13100794 4. Demareva V. Functional Hemispheric Activity and Asymmetry Markers of Effective Foreign Language Performance in 3rd-Grade, 10th-Grade, and University Students. Symmetry 2022, 14, 1659. https://doi.org/10.3390/sym14081659 5. Demareva V.A., Golubinskaya A.V., Edeleva Yu.A., Golubin R.V. (2022). Evaluation of level of foreign language proficiency based on eye movement data. J. Opt. Technol., 89(8), 484-489. https://doi.org/10.1364/jot.89.000484
	Results of intellectual activity 1. AUTOMATED SYSTEM FOR CONTINUOUS MONITORING OF VIGILANCE OF TRAIN DRIVER AND METHOD FOR CONTINUOUSLY MONITORING VIGILANCE OF TRAIN DRIVER USING THIS SYSTEM. Demareva V.A., Golubin R.V., Demarev A.B., Zhukova M.V., Zajtseva I.O., Zueva K.I., Nazarov N.A., Osokin V.A., Okhrimchuk Ya.A., Selezneva E.I., Tikhomirova E.A. № RU 2814302 C1 from 04.04.2023. 2. SYSTEM AND METHOD FOR DETERMINING AN EYE MOVEMENT. Demareva V.A., Filimonov A.V., Filatova A.S., Shishalov I.S., Burashnikov E.P., Devyatkin A.S., Sotnikov M.S. № EP 3 989 045 A1, application 27.04.2022. 3. SYSTEM AND METHOD FOR DETERMINING AN EYE MOVEMENT. Demareva V.A., Filimonov A.V., Filatova A.S., Shishalov I.S., Shishanov S.V., Burashnikov E.P., Devyatkin A.S., Sotnikov M.S. № US 2022/0117529 A1, application 21.04.2022. 4. System and method for determining cognitive demand. Demareva V.A., Filimonov A.V., Filatova A.S., Burashnikov E.P., Shishanov S.V., Shishalov I.S., Devyatkin A.S., Sotnikov M.S., Burova A.S., Kilyazov V.V., Bakhchina A.V. № WO2022055383A1, application 17.03.2022. 5. Bykov Yu.V., Demareva V.A., Plesovskikh K.Yu. METHOD OF CONTROLLING ATTENTION IN GAMING. № RU 2674191 C1, 05.12.2018. № 2017140169 from 20.11.2017. 6. Polevaya S.A., Demareva V.A. METHOD FOR DETERMINING LANGUAGE AND PROFESSIONAL COMPETENCE. № RU 2594102 C1 from 10.08.2016