Researcher profile (portfolio) form for potential research supervisors of postgraduate track participants in the Global Universities Association International Olympiad for graduate and postgraduate applicants

University	National Research Tomsk Polytechnic University
English language proficiency	C1 CEFR
Applicant's postgraduate program	Software and hardware for biomedical applications
List of research projects of a potential research supervisor (participation/leadership)	Hardware-software complex for electrical impedance visualization of the cryodestruction zone (supervisor). Ultrasonic spirograph (head). Hardware-software complex for assessing the functional state of the brain based on broadband electrical impedance spectroscopy (supervisor). Hardware-software complex for the implementation of a non-invasive neural interface (head). Software and hardware complex for measuring the electrical parameters of cells in the flow cytometry mode (supervisor). Biocompatible electrodes for "smart clothes" (project participant). Software package for creating personalized talus implants (project participant)
List of possible research topics	Software and hardware complex for the study of nanoparticles by chronofemtoamperometry. Development and implementation of a method for creating personalized implants with optimized biomechanical parameters. Development of an electrochemical cell for broadband electrical impedance spectroscopy. Development of algorithms and software to process broadband electrical impedance spectra. Development of a software and hardware complex to evaluate the viscosity of biological fluids using supermagnetic nanoparticles.
	Supervisor's research interests : Numerical modeling of biotechnical and living systems, creation of digital twins of biotechnical systems, design of devices, systems and implants for medical applications
	Research highlights (if applicable): Specify the key highlights of the program that make it stand out from others. (Use of unique equipment, collaboration with foreign scientists and research centers, financial support for graduate students, etc.) All research are carried out under the direct supervision of industrial partners in cooperation with leading scientific and educational institutions. In most cases, it is possible to verify digital models and equipment in vivo.

<table>
<tr><td rowspan="2">Research supervisor:
Konstantin S,
Doctor of Technical Science, 2016, TPU.</td><td>Supervisor’s specific requirements:
• English at least B1 CEFR</td></tr>
<tr><td>Supervisor’s main publications (specify a total number of publications in journals indexed by Web of Science, Scopus, RSCI for the last 5 years, list up to 5 most significant publications with the publication details):

• Molecular Plasmonic Silver Forests for the Photocatalytic-Driven Sensing Platforms. Nanomaterials 2023, 13, 923. https://doi.org/10.3390/nano13050923
• IN VITRO BIODEGRADATION OF A-C:H:SIOX FILMS ON TI-6AL-4V ALLOY Grenadyorov A., Solovyev A., Oskomov K., Porokhova E., Gorokhova A., Nasibov T., Khlusov I., Brazovskii K., Litvinova L.Materials. 2022. T. 15. № 12.
• A DEVICE FOR MEASURING ELECTRICAL PARAMETERS OF BIOLOGICAL TISSUES DURING CRYODESTRUCTION Brazovskii K.S., Koroluk E.S. Biomedical Engineering. 2021. T. 54. № 6. C. 402-406.
• FLEXIBLE AND WATER-STABLE GRAPHENE-BASED ELECTRODES FOR LONG-TERM USE IN BIOELECTRONICS Murastov G., Bogatova E., Brazovskiy K., Lipovka A., Dogadina E., Cherepnyov A., Ananyeva A., Plotnikov E., Rodriguez R.D., Sheremet E., Amin I., Ryabov V. Biosensors and Bioelectronics. 2020. T. 166. C. 112426.
• NEW ARTIFICIAL NETWORK MODEL TO ESTIMATE BIOLOGICAL ACTIVITY OF PEAT HUMIC ACIDS Zykova M.V., Veretennikova E.E., Logvinova L.A., Romanenko S.V., Bratishko K.A., Belousov M.V., Brazovsky K.S., Yusubov M.S., Lyapkov A.A., Danilets M.G., Trofimova E.S., Ligacheva A.A. Environmental Research. 2020. T. 191. C. 109999.</td></tr>
<tr><td></td><td>Intellectual property rights (if applicable)
(list key intellectual deliverables)
ELVIRA. SOFTWARE FOR ELECTRIC IMPEDANCE TOMOGRAPH Korolyuk E.S., Konev A.V., Brazovskiy K.S. Certificate of registration of the computer program 2021668677, 11/18/2021. Application No. 2021666809 dated 10/25/2021.
BUILT-IN SOFTWARE FOR PROBING PULSES GENERATOR OF ELECTRIC IMPEDANCE TOMOGRAPH Korolyuk E.S., Brazovskiy K.S. Certificate of registration of the computer program 2020616821, 06/23/2020. Application No. 2020615950 dated 06/11/2020.
CONTROL DEVICE FOR ELECTRIC IMPEDANCE TOMOGRAPHY WHEN FREEZING BIOLOGICAL TISSUES Korolyuk E.S., Brazovskiy K.S. Utility model patent 199056 U1, 08/11/2020. Application No. 2020118747 dated 06/07/2020.
3D RECONSTRUCTION OF THE SURFACE OF THE CONTROL OBJECT BASED ON ACOUSTIC GRILLE DATA Soldatov A.I., Kostina M.A., Brazovskiy K.S., Sorokin P.V. Certificate of registration of the computer program RU</td></tr>
</table>

	2019614460, 04/05/2019. Application No. 2019613349 dated 03/29/2019. DEVICE FOR REGISTRATION OF HEART RATE AND RHEOGRAM OF FETUS FROM ABDOMINAL ELECTRODES Brazovskiy K.S., Pekker Y.S., Melchenko E.D., Melchenko S.V. Utility model patent RU 134773 U1, 11/27/2013. Application No. 2013104574/14 dated February 4, 2013. A SYSTEM FOR SEARCHING AREAS OF INTEREST IN THREE-DIMENSIONAL MEDICAL IMAGES Brazovskiy K.S., Demkin V.P., Pekker Ya.S., Stromov G.G., Fokin V.A. Utility model patent RU 120799 U1, 09/27/2012. Application No. 2012120278/08 dated May 17, 2012.