

**HORIZON EUROPE Research and Innovation Framework Programme  
MARIE SKŁODOWSKA-CURIE ACTIONS**

**INVITATION TO APPLY FOR  
POSTDOCTORAL FELLOWSHIPS 2022**



<b>Organisation Name/ Department</b>	Czech University of Life Sciences Prague/Faculty of Engineering, Department of Electrical Engineering and Automation
<b>Website of the organisation</b>	<a href="https://www.tf.czu.cz/en">https://www.tf.czu.cz/en</a> <a href="https://www.facebook.com/tf.czu.cz">https://www.facebook.com/tf.czu.cz</a> <a href="https://www.instagram.com/tfczucz/">https://www.instagram.com/tfczucz/</a>
<b>Research Fields</b>	<input type="checkbox"/> Chemistry (CHE) <input type="checkbox"/> Social Sciences and Humanities (SOC) <input type="checkbox"/> Economic Sciences (ECO) <input checked="" type="checkbox"/> Information Science and Engineering (ENG) <input type="checkbox"/> Environment and Geosciences (ENV) <input checked="" type="checkbox"/> Life Sciences (LIF) <input type="checkbox"/> Mathematics (MAT) <input type="checkbox"/> Physics (PHY)
<b>Sub-Fields/ Keywords</b>	Precision agriculture, Digital twin, Discrete element method, Finite element method, Abrasive wear modelling
<b>Marie Skłodowska-Curie Action(s) of interest</b>	<input checked="" type="checkbox"/> <b>European Postdoctoral Fellowships</b> ( <i>European nationals or long-term residents working on R&amp;I projects with organisations outside EU Member States and Horizon Europe Associated Countries</i> ). <b>Duration:</b> 24-36 months (12-24 months outgoing phase in a non-associated Third Country (TC) & 12 months mandatory return phase to a host)

	<p>organisation in Europe).</p> <p><input checked="" type="checkbox"/> <b>Global Postdoctoral Fellowships</b> (researchers of any nationality working on R&amp;I projects by either coming to Europe from any country in the world or moving within Europe).</p> <p><i>Duration: 12-24 months</i></p>
<p><b>Short Description of the Organisation/ Department</b></p>	<p><b>DESCRIPTION OF THE ORGANISATION/ DEPARTMENT:</b> Department of Electrical Engineering and Automation</p> <p><b>EXPERTISE:</b> The Department of Electrical Engineering and Automation has extensive expertise focusing on machinery and soil processing simulation via FEM and DEM, live parameters monitoring, laboratory and computational results evaluation.</p> <p><b>RESEARCH TEAM COMPOSITION:</b> The research team consists of associate professors, assistant professors, Ph.D. students:</p> <ul style="list-style-type: none"> <li>✓ Assoc. prof. Rostislav Choteborsky (ORCID 0000-0002-8694-4453);</li> <li>✓ Assoc. prof. Miloslav Linda (ORCID 0000-0003-2753-4144);</li> <li>✓ Assoc. prof. Monika Hromasova (ORCID 0000-0001-5849-1955);</li> <li>✓ Assist. prof. Egidijus Katinas (ORCID 0000-0002-1908-4465);</li> <li>✓ PhD students:</li> <li>✓ Ing. Jiri Kure, Ing. Barbora Cernilova.</li> </ul> <p><b>STRENGTHS AND SCIENTIFIC ACHIEVEMENTS:</b> The research activities in the department are focused on the mechanical process simulation by FEM, soil properties evaluation in a laboratory (field) and simulation by DEM, abrasive wear measurement and simulation, and laboratory (field) experiment comparison with simulation.</p> <p><b>Important publications:</b></p> <ol style="list-style-type: none"> <li>1. Katinas, Egidijus; Choteborsky, Rostislav; Linda, Miloslav; Kure, Jiri. <i>Sensitivity analysis of the influence of particle dynamic friction, rolling resistance and volume/shear work ratio on wear loss and friction force using DEM model of dry sand rubber wheel test // Tribology</i> International ISSN 0301-679X, 2021, vol. 156, p. 106853. DOI.org/10.1016/j.triboint.2021.106853. Science Citation Index Expanded (Web of Science); ScienceDirect; INSPEC; CAB Abstracts; Scopus. WOS, IF: 4.872, AIF: 3.44, cat: 1, av: 1.416, 2020, Q1] [SCOPUS, citescore: 8, snip: 2.061, sjr: 1.401, year: 2020, quartile: Q1];</li> </ol>

2. Kesner, Adam; Choteborsky, Rostislav; Linda, Miloslav; Hromasova, Monika; Katinas, Egidijus; Sutanto, Hadi.  
*Stress distribution on a soil tillage machine frame segment with a chisel shank simulated using discrete element and finite element methods and validate by experiment // Biosystems engineering.*  
ISSN 1537-5110, vol. 209, p. 125-138.  
[doi.org/10.1016/j.biosystemseng.2021.06.012](https://doi.org/10.1016/j.biosystemseng.2021.06.012). Science Citation Index Expanded (Web of Science); ScienceDirect; Scopus. WOS, IF: 4,123, 2020, Q1] [SCOPUS, citescore: 7.2 snip: 2.120, sjr: 0.894, year: 2020, quartile: Q1];
3. Katinas, Egidijus; Choteborsky, Rostislav; Linda, Miloslav; Jankauskas, Vytenis.  
*Wear modelling of soil ripper tine in sand and sandy clay by discrete element method // Biosystems engineering. San Diego: Academic Press Inc Elsevier Science.*  
ISSN 1537-5110, 2019, vol. 188, p. 305-319.  
DOI:10.1016/j.biosystemseng.2019.10.022. Science Citation Index Expanded (Web of Science); ScienceDirect; Scopus. WOS, IF: 3.215, AIF: 3.471, cat: 2, av: 1.326, 2019, Q1] [SCOPUS, citescore: 6.4, snip: 1.97, sjr: 0.857, year: 2019, quartile: Q1] [ai: 0.354, iai: 0.354, na: 4, nia :2, nip: 1, pai: 1.01, paii: 1.01, al: 1.071];
4. Jankauskas, Vytenis; Katinas, Egidijus; Laskauskas, Artūras; Antonov, Maksim; Varanauskas, Valentinas; Gedzevičius, Irmantas; Aleknevičienė, Vilija.  
*Effect of electrode covering composition on the microstructure, wear, and economic feasibility of Fe-C-Cr manual arc-welded hardfacings // Coatings. Basel: MDPI AG.*  
ISSN 2079-6412, 2020, vol. 10, iss. 3, p. 1-19.  
DOI:10.3390/coatings10030294. Science Citation Index Expanded (Web of Science); Current Contents Engineering (Computing & Technology). WOS, IF: 2.881, AIF: 5.286, cat: 3, av: 0.514, year: 2020, quartile: Q2] [SCOPUS, citescore: 3, snip: 0.998, sjr: 0.484, 2020, Q2. [ai: 0, iai: 0, na: 7, nia :3, nip: 2, pai: 0, paii: 0, al: 1.357];

**IMPORTANT INFRASTRUCTURE:**

- ✓ Department is fully equipped with the software's newest version used for simulations (Ansys, rocky DEM, LS-Dyna) and hardware server (72 cores, 3 tb ram, 30 tb hdd, 2 x nvidia p100, 1 x nvidia V100), PC (preprocessing and postprocessing Xeon processor type).
- ✓ Laboratories are equipped with soil processing and measuring tools (soil bin, tillage tools, strain gauge) as well as microstructure and material analysis laboratories.

<p><b>Previous Projects/ Research Experience</b></p>	<ul style="list-style-type: none"> <li>✓ Advanced methods of functional agricultural machines design using the latest numerical methods – Project goal is research and development of digital design and testing of agricultural machinery and its functional properties, development of a new agricultural machine prototype for digital testing validation. Ministry of Industry and Trade of the Czech Republic</li> <li>✓ <a href="#">Research and development of working tools for agricultural machines</a> - Project goal is shape and material optimization of working tools of agricultural machines in order to improve work quality, durability and energy efficiency. Technology Agency of the Czech Republic</li> <li>✓ Modularity of agricultural machinery with the support of advanced production technologies - The aim of the project is to innovate the modularity of the agricultural machine using a complex system for simulation and verification of machine design solutions using chisel and disk arrangement of soil processing tools. Ministry of Industry and Trade of the Czech Republic</li> <li>✓ <a href="#">Research and development of innovative school furniture with application of sensor technology</a> - The main goal of the project is the development of a new range of school furniture, which meets all requirements of Czech and European standards and the needs of users in the field of design, meets the increased demands of specialists, especially pediatricians, on their fitness, safety and ergonomics. Technology Agency of the Czech Republic</li> <li>✓ Development of servo drive test bench for testing and setting up MODACT electric servo motors – Ministry of Industry and Trade of the Czech Republic</li> </ul>
<p><b>Thematic areas and a list of supervisors who are going to participate in preparing a project proposal with postdoctoral researchers.</b></p>	<p><b>THEMATIC AREA:</b> Soil processing model, Discrete element method, Finite element method, Wear analysis.</p> <p><b>SUPERVISOR:</b> Ing. Egidijus Katinas PhD.</p> <ul style="list-style-type: none"> <li>• <b>Current position:</b></li> <li>✓ Since 2021 Asistant professor at Czech University of Life Sciences Prague.</li> <li>• <b>Professional profile:</b></li> <li>✓ 10 publications with impact factor,</li> <li>✓ Master thesis awarded in the field of technology science (2016),</li> <li>✓ Scholarship for PhD students for study results from Research Council of Lithuania (2017-2018).</li> </ul>

	<ul style="list-style-type: none"> <li>• <b>Research experience &amp; Education:</b></li> </ul> <p>Degree:</p> <ul style="list-style-type: none"> <li>✓ 2015-2019 PhD, Vytautas Magnus University;</li> <li>✓ 2013-2015 Master degree, Aleksandras Stulginskis University;</li> <li>✓ 2009-2013 Bachelor degree, Aleksandras Stulginskis University.</li> </ul> <p>Work Experience:</p> <ul style="list-style-type: none"> <li>✓ 2020-2021 Postdoc fellowship at Czech University of Life Sciences Prague;</li> <li>✓ 2017-2018 junior researcher at Aleksandras Stulginskis University;</li> </ul>
<p><b>Short description of Postdoctoral Fellowships programme</b></p>	<p>Postdoctoral researcher activities will be focused on the following areas:</p> <ul style="list-style-type: none"> <li>✓ the soil particle properties, interaction,</li> <li>✓ tracing analysis and simulation,</li> <li>✓ deepened knowledge of finite and discrete element method, actual force measurement during soil processing and comparison with simulation results,</li> <li>✓ simulated worn surface analysis and comparison to the actual shape.</li> </ul>
<p><b>Contact Person/ Position in the Organisation/ Phone/ E-mail</b></p>	<p>Pavlina Ruzickova project manager email: ruzickova@tf.czu.cz phone: + 420 605 294 906</p>
<p><b>Deadline for Expressions of Interest from postdoctoral researchers</b></p>	<p>28 February 2022</p>
<p><b>Necessary documents from applicants (postdoctoral researchers)</b></p>	<ul style="list-style-type: none"> <li>✓ CV</li> <li>✓ List of publications</li> <li>✓ Brief description of the project idea</li> </ul> <p><i>(a project proposal will be made jointly by the researcher and a host institution)</i></p>
<p><b>What we offer</b></p>	<ul style="list-style-type: none"> <li>✓ Full-time contract to work on a research project and enjoy advanced training,</li> <li>✓ Competitive salary – (€ 5 080*0.791) = gross amount, including compulsory deductions under national law, such as employer and employee social security contributions and direct taxes;</li> <li>✓ Mobility (€ 600) and Family allowances (if applicable - € 660);</li> <li>✓ Budget for Research, Training and Networking costs (€ 1 000);</li> <li>✓ Special needs allowance (if applicable).</li> </ul>



<p><b>Eligibility of Applicants</b></p>	<p><b>Experience:</b></p> <ul style="list-style-type: none"> <li>✓ Applicants should be in a possession of a doctoral degree at the call deadline (applicants who have successfully defended their doctoral thesis but who have not yet formally been awarded the doctoral degree will also be considered eligible to apply).</li> <li>✓ At the call deadline, supported researchers must have a maximum of 8 years full-time equivalent experience in research, measured from the date of award of the doctoral degree (exceptions that will not count towards the amount of research experience: career breaks, work outside research, research outside Europe for reintegrating researchers).</li> </ul> <p><b>Mobility rule:</b></p> <ul style="list-style-type: none"> <li>✓ researchers of any nationality</li> <li>✓ European Postdoctoral Fellowships - applicants must not have resided or carried out their main activity (work, studies, etc.) in the country of the beneficiary for more than 12 months in the 36 months immediately before the call deadline,</li> <li>✓ Global Postdoctoral Fellowships - applicants must not have resided or carried out their main activity (work, studies, etc.) in the country of the host organisation for the outgoing phase for more than 12 months in the 36 months immediately before the call deadline.</li> <li>✓ Researchers reintegrating from a TC must either be based in a TC at the call deadline or have moved directly from a TC to an EU MS or HE AC within the last 12 months before the call deadline.</li> </ul>
<p><b>Additional Funding Opportunity</b></p>	<p><b>ERA Fellowships</b></p> <ul style="list-style-type: none"> <li>✓ It is open to researchers of any nationality who wish to engage in R&amp;I projects by either coming to Europe from any country in the world or moving within Europe to a Widening Country.</li> <li>✓ In order to apply for the ERA Fellowships call, applicants need to submit their proposal to the 2021 MSCA PF call.</li> <li>✓ To be eligible to this call the host organisation must be located in an eligible widening country.</li> <li>✓ The application to the MSCA PF call will be automatically resubmitted to this call in case the proposal fails to reach an adequate place in the ranking to be funded.</li> </ul>