Special Session Proposal for the 65th ERSA Congress, under the theme "Machine learning methods in the service of regional science" to be held from 25th to 28th August 2026 at Sofia (Bulgaria). https://ersa.eventsair.com/ersa2026/call-for-special-session

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Rationale and relevance

The 65th ERSA Congress theme, "Global Challenges and Regional Responses in a Transition Era", calls for analytical approaches capable of supporting regions as they respond to economic, social, environmental, technological, and geopolitical transitions. Machine-learning methods, and particularly AI, provide scalable tools for extracting information from complex spatial datasets, evaluating land-use patterns, and anticipating future pressures. This proposed session would focus on how these techniques can be applied to build evidence-based regional responses, improve land-allocation decisions, and support forward-looking planning in rapidly changing environments. For audience, the session would target researchers and practitioners engaged in regional science, land-use modelling, spatial planning, GIS/data science, ecology, environmental management, and climate-change adaptation.

Session aims

- Present methodological advances in spatial machine learning relevant to regional analysis and land-use modelling.
- Demonstrate how ML-derived suitability assessments can inform land-use allocation, resource management, and regional development strategies.
- Show how climate- and scenario-based projections can be integrated into regional planning processes.
- Address technical issues such as raster harmonisation, integration of heterogeneous datasets, uncertainty assessment, and reproducible workflows.
- Promote exchange between researchers and practitioners applying ML in regional science, planning, and environmental management.

Example topics

- Neural-network and ML models for land-use suitability classification using environmental and human-pressure variables.
- Quantitative comparisons between predicted suitability and observed land use to identify mismatches, inefficiencies, or conflicts.
- Scenario-based projections of land-use change under different climate pathways and their implications for regional policy.
- Practical use of ML outputs in territorial planning, conservation prioritisation, and climate-adaptation strategies.

- Transparent data pipelines, open datasets, and reproducible ML workflows for spatial analysis.

Example presentation

1. Belchior Manuel belchiormanuel.bm@gmail.com – Catholic University of Beira, Mozambique. Planning Carbo Sequestration on the Zambeze Basin. An Artificial Intelligence Approach
2. Liz Musvoto liz.musvoto@uct.ac.za Land Suitability Mapping of South Africa. University of Cape Town.
3. Anargul Belgibayeva anar.belgibayeva@gmail.com Spatial Interaction Model with Land Use using Artificial Intelligence to estimate Land Aptitudes. An application to analyse the impact of climate change in Kazakhstan.
4. Reid, Neil NEIL.REID@utoledo.edu Artificial Intelligence to identify the potential of vineyards in Europe.
5. Nonna Khachatryan nonnakhachatryan@ysu.am Spatial Interaction Model with Land Use for Armenia using Artificial Intelligence.
6. Alexandru Banica alexandrubanica@yahoo.com Spatial Interaction Model with Land Use using Artificial Intelligence to estimate Land Aptitudes. An application to analyse the impact of climate change in Romania
7. Gabor Pozsgai pozsgaig@coleoptera.hu Where can Tea and Coffee can be grown in Macaronesia. AI may know.
8. Tomaz Dentinho tomas.lc.dentinho@uac.pt Land Use Consistent Planning for Sustainable Development Goals using Artificial Intelligence.