FRM II
Forschungs-Neutronenquelle
Heinz Maier-Leibnitz

MLZ
Heinz Maier-Leibnitz Zentrum

Machine learning in neutron activation and gamma spectroscopy

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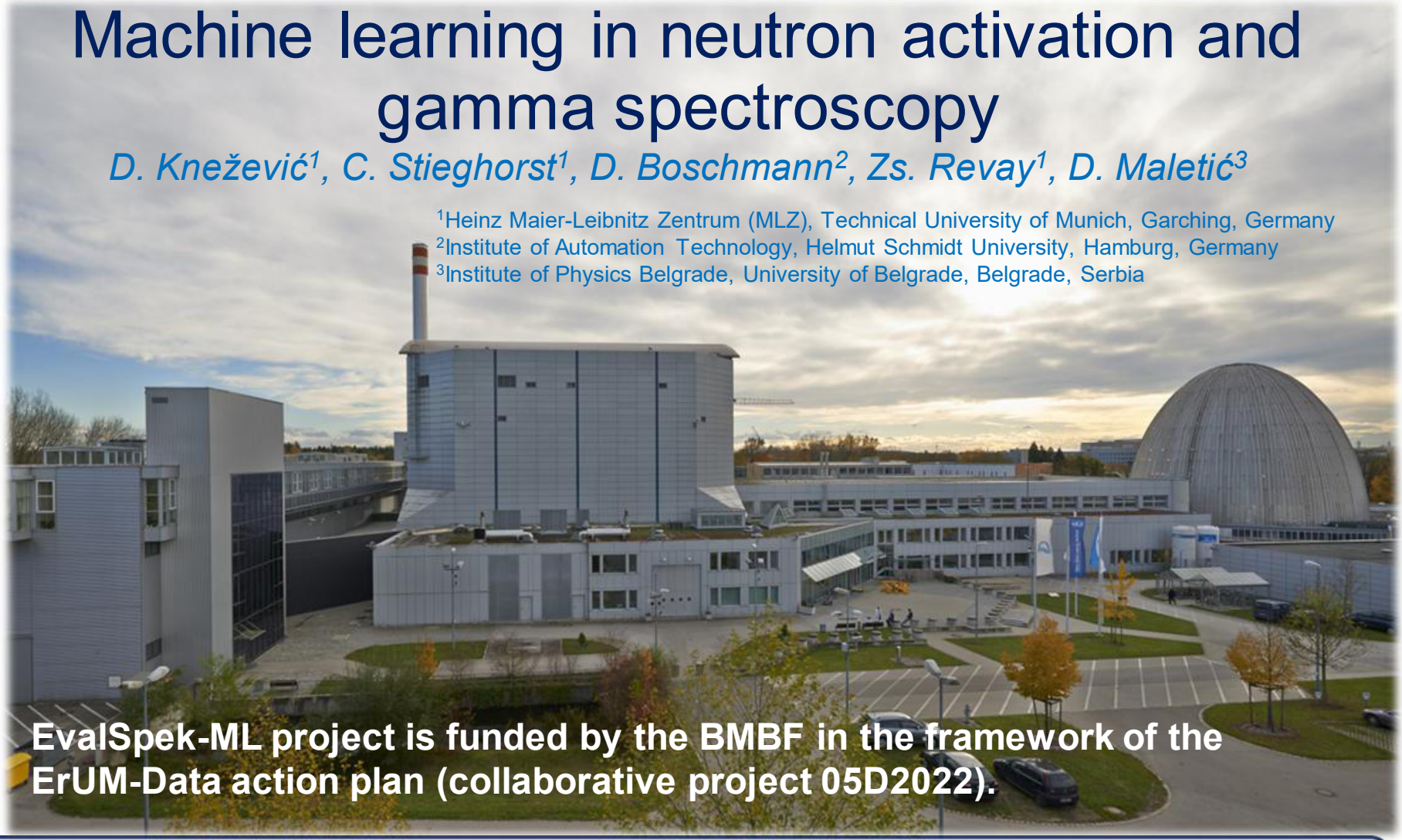


EvalSpek-ML project is funded by the BMBF in the framework of the ErUM-Data action plan (collaborative project 05D2022).

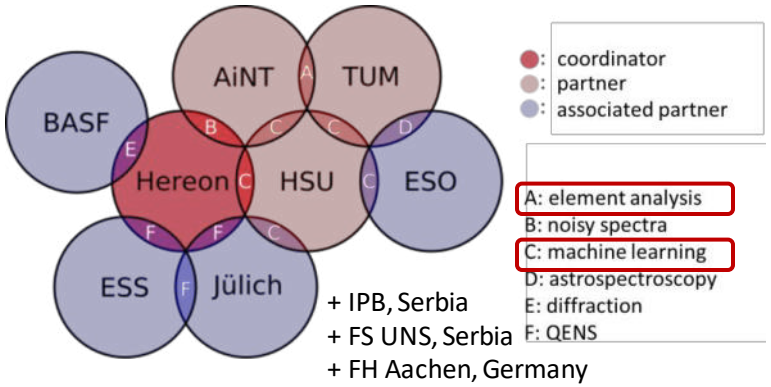
MLZ is a cooperation between:

JÜLICH Forschungszentrum

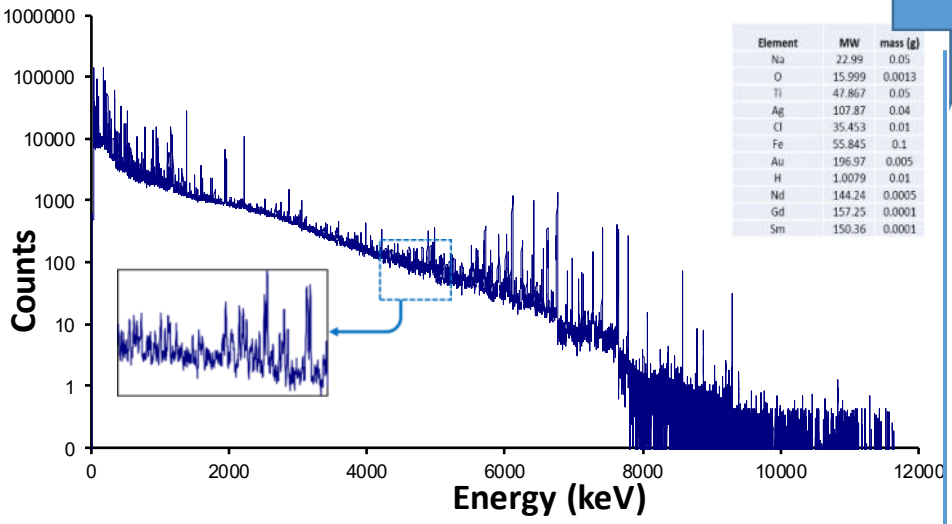
Helmholtz-Zentrum hereon

Technical University of Munich

EvalSpek-ML - PGAA

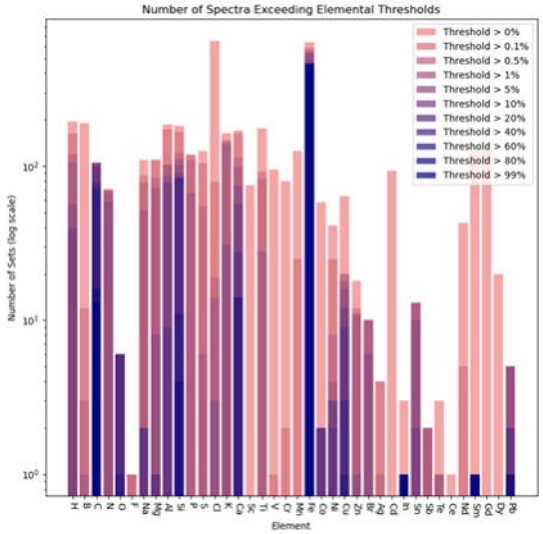


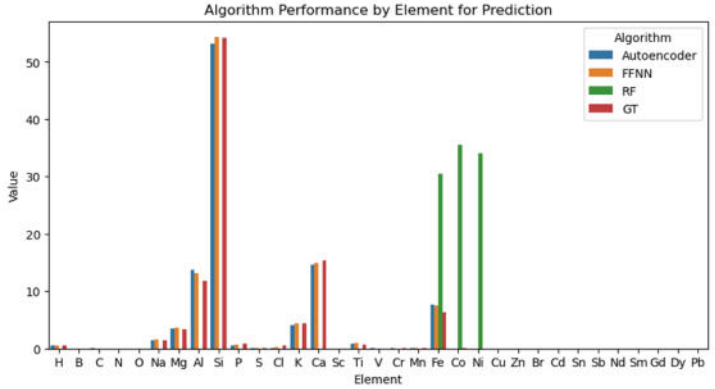
Project funded by the **BMBF** in the framework of the **ErUM-Data** action plan (collaborative project 05D2022).



Element	MW	mass (g)
Na	22.99	0.05
O	15.999	0.0013
Ti	47.867	0.05
Ag	107.87	0.04
Cl	35.453	0.01
Fe	55.845	0.1
Au	196.97	0.005
H	1.0079	0.01
Nd	144.24	0.0005
Gd	157.25	0.0001
Sm	150.36	0.0001

Simple methods were tested, as well as Autoencoders, currently investigating other possibilities.

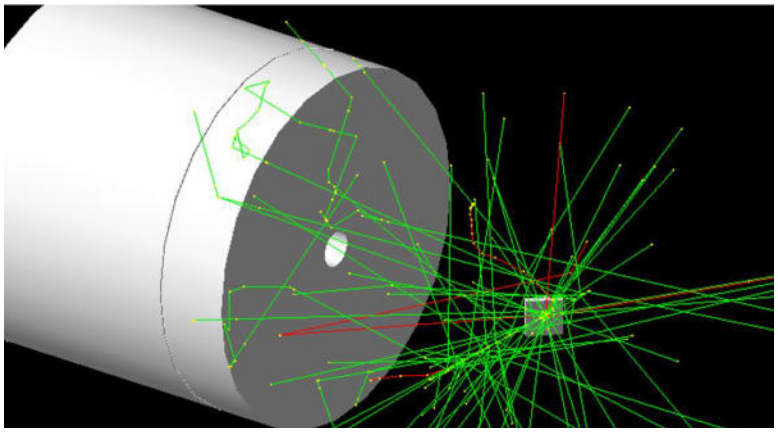


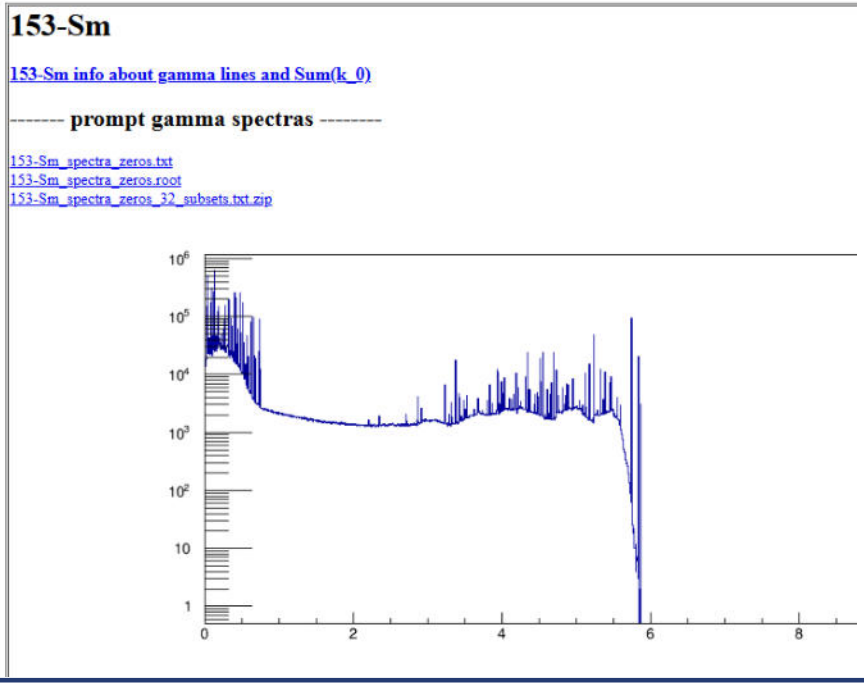


*Boschmann et al. Automation of PGAA Spectra Analysis with Deep Learning, 2024 IEEE 22nd International Conference on Industrial Informatics (INDIN), 2024

Future Work

Simulations





Next projects

R&D of forward model-based ML approaches which will be used to predict data output in various application areas.

In case of FRM2 PGAA group: Instrumental neutron activation analysis (**INAA**) and neutron depth profiling (**NDP**).

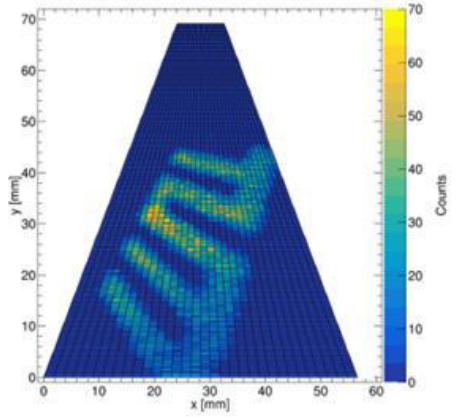


Figure 1: NDP mapping test: A 1-mm-pinhole was used and the result on a 2D detector is a convolution of the pinhole and the image (TUM logo).