

## Call for Papers

Special Session on

# Robustness, Stability, and Accuracy in Deep Neural Networks

at the 33rd International Conference on Artificial Neural Networks ICANN 2024



Recent years have witnessed tremendous success in the applications of neural networks and deep learning, in particular in tasks ranging from pattern recognition in images to autonomous driving and processing of natural language. Despite this progress, many theoretical questions still require attention and resolution.

This special session will provide a forum for discussing some of them, in particular the questions concerning simultaneous robustness to perturbations, accuracy on the test sets and generalisation, overfitting and learning from few examples in high-dimensional settings, various notions of data dimension and its benefits, and influence of the choice of network architectures (numbers of their layers and types of computational units) on accuracy and robustness of network performance. Other pressing challenges which we would like to discuss include the issue of errors, their identification and correction with provable performance guarantees, and the fundamental understanding of uncertainties and their formalisation and capture in modern learning algorithms.

### SPECIAL SESSION TOPICS

Contributions that offer theoretical insights, algorithmic advancements, and verifiable heuristics including topics (non-exhaustive list)

- Robustness and reliability of deep networks
- Accuracy on test sets and generalization
- Influence of network depth on its accuracy
- Stability wrt small perturbations
- Learning in high-dimensional settings
- Errors of neural networks and methods to reliably address them

High-quality application-focussed papers highlighting and discovering new issues related to robustness, reliability, accuracy, and stability will also be considered.

### SUBMISSION INSTRUCTIONS

Contributions (full papers 12-15 pages and short papers 6-11 pages) have to be submitted through the regular ICANN submission system at

<https://e-nns.org/icann2024/>

Select track **Special Session: Accuracy, Stability, and Robustness in Neural Networks**. Accepted papers to the special session will appear in the proceedings of the ICANN 2024 conference.

### ORGANIZERS

Prof. Věra Kůrková, Institute of Computer Science of the Czech Academy of Sciences, Prague, Czech Republic  
Contact: [vera@cs.cas](mailto:vera@cs.cas)

Prof. Ivan Tyukin, King's College, London, UK  
Contact: [ivan.tyukin@kcl.ac.uk](mailto:ivan.tyukin@kcl.ac.uk)