Call for Special Issue of *Extremes*:
Bridging Heavy Tails and Artificial Intelligence



Aims

The increasing frequency and severity of extreme events—such as catastrophic flooding, record-breaking temperatures, and unprecedented heatwaves—has highlighted the urgent need for innovative approaches in risk assessment and modeling. Modern advancements in data-collection techniques have provided increasingly large and complex datasets, which can only be processed used fast and scalable algorithms and computational software. This special issue aims to bridge the gap between Artificial Intelligence (AI) and Extreme Value Theory (EVT) to harness the strengths of both fields and address the growing challenges posed by these extreme events.

We invite contributions that explore novel methods and applications at the intersection of AI and EVT, pushing the boundaries of current research. Contributions should be based on solid mathematical theory as the foundation for extrapolation—including regular variation and asymptotic principles.

Topics

We encourage submissions on, but not limited to, topics such as:

- Interfaces between regularly-varying tails and machine learning.
- Neural architectures for modeling heavy-tailed phenomena.
- Explainability of machine learning models for extremes.
- Generative models for extreme events.
- Online learning methods for extreme events.

Main methodological contributions should be numerically assessed via Monte Carlo evidence based on artificial data, and illustrated with a real-data application. Since the interface between AI and EVT is relatively new, submissions should focus on original methodological contributions rather than review articles.

Submissions

This issue will be published by *Extremes*, which is the world-leading international journal on EVT and its applications across various fields. Manuscripts must be submitted via the Springer website (via SNAPP),

https://link.springer.com/journal/10687/submission-guidelines

and following the guidelines available from the same link. Submissions must be original, unpublished, and not under consideration elsewhere, and should include a cover letter outlining their significant contributions relative to current progress in the field.

Important Dates

This special issue will open for submissions on November 1, 2024, with a submission deadline of March 30, 2025. Reviews will begin as submissions are received in the editorial system.

Guest Editors

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