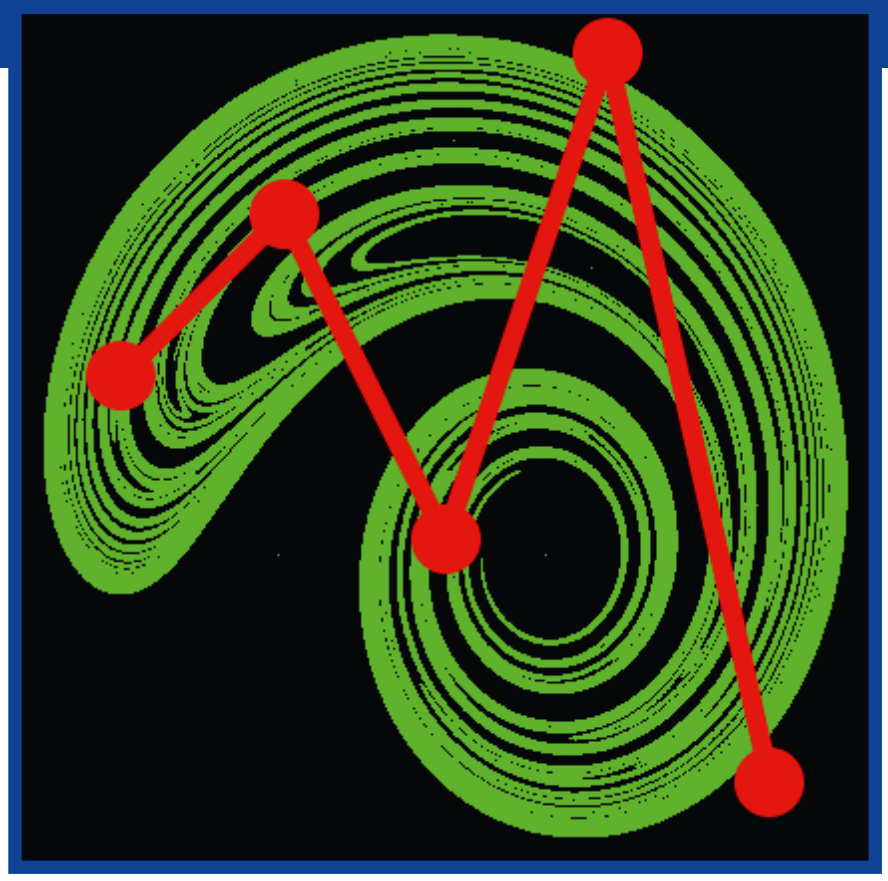
MAX PLANCK GESELLSCHAFT

mpipks

Ordinal methods: Concepts, applications, new developments and challenges



International Workshop 28 Feb - 4 Mar 2022

The year 2022 is the 20th anniversary of the seminal paper of C. Bandt and B. Pompe on permutation entropy. During this time, the new "ordinal" methodology has been developed by theoreticians and practitioners in different directions. However, many of the new concepts and approaches are not fully understood and there is also a need for a more systematic application of ordinal methods. In particular, the new developments have to be considered in the light of different and more general frameworks, such as ordinal statistics and ordinal methods in machine learning. The aim of this workshop is to bring together researchers from different disciplines to address those challenges.

Topics:

- New theoretical results and practical applications
- Generalization of concepts and methods from the one-dimensional to the multidimensional case
- Appropriate application of ordinal methods to practical problems
- Optimal extraction of information from ordinal patterns
- General ordinal approaches based on the theories of dynamical systems, complexity systems, stochastic processes, and information
- Better theoretical understanding of several new variants of permutation entropy and their relationship to each other and to established measures of complexity
- Ordinal networks and applications
- Development of reliable ordinal pattern-based statistical estimation and hypothesis testing for the analysis of real-world data
- Use of ordinal methods in machine learning, including feature extraction on an ordinal base

Invited speakers:

Christoph Bandt (DE)
Aurelio Bariviera (ES)
Annika Betken (NL)
Laura Carpi (BR)
Debora Correa (AU)
Claudio Delrieux (AR)
Armand Fouda (CM)
Alejandro Frery (NZ)
Hiroshi Gotoda (JP)
Grzegorz Graff (PL)
Beata Graff (PL)
Tim Gutjahr (DE)
Taichi Haruna (JP)
Yoshito Hirata (JP)
Dimitris Kugiumtzis (GR)
Jürgen Kurths (DE)
Holger Lange (NO)
Walter Legnani (AR)
Klaus Lehnertz (DE)
Inmaculada Leyva (ES)
Johann Martínez (ES)
Cristina Masoller (ES)
Diego Mateos (AR)
Mariano Matilla-García (ES)
Marisa Mohr (DE)
Fernando Montani (AR)
María Muñoz-Guillermo (ES)
Felipe Olivares (CL)
Milan Palus (CZ)
David Papo (ES)
Ulrich Parlitz (DE)
Evgeniy Petrov (UA)
Manuel Pulido (AR)
Haroldo Ribeiro (BR)
Manuel Ruiz Marín (ES)
Alexander Schnurr (DE)
Michael Small (AU)
Miguel Cornelles Soriano (ES)
Borko Stošic (BR)
Tatijana Stošic (BR)
Piergiulio Tempesta (ES)
Christian Weiß (DE)
Massimiliano Zanin (ES)
Yong Zou (CN)
Luciano Zunino (AR)

Scientific coordinators:

José M. Amigó
(Elche, Spain)

Karsten Keller
(Lübeck, Germany)

Osvaldo Rosso
(Maceió, Brasil)

Organisation:

Maria Voigt, MPIPKS Dresden

Applications received before 5th January 2022 are considered preferentially.

We plan for a **hybrid workshop** with a number of participants on-site and the others connected remotely. Online attendance will be possible in any case. The organizers will inform about an option of on-site attendance at a later stage.

For on-site participation the registration fee is 140 Euro; costs for accommodation and meals will be covered by the Max Planck Institute. Limited funding is available to partially cover travel expenses.

No fee for remote participation.

For further information please contact:
Visitors Program – Maria Voigt
MPI for the Physics of Complex Systems
Nöthnitzer Str. 38, D-01187 Dresden
Tel: +49-351-871-1934
orpatt22@pks.mpg.de
www.pks.mpg.de/orpatt22

Max Planck Institute for the Physics of Complex Systems

We also offer individual fellowships (phd, postdoc, sabbatical). Applications are accepted continuously. For details, please check www.pks.mpg.de/visitors