



UNIVERSITÀ DI PISA
DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE
Dottorato di Ricerca in Ingegneria dell'Informazione

Doctoral Course

“Nonlinear dynamical systems and complexity”

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Short Abstract: In recent years it has become clear that nonlinear dynamical systems have an extremely important role in modeling phenomena of different origin (physical, biomedical, economic, etc). I intend to present the basic notions of the theory of nonlinear dynamical systems and their applications to real world time series. With the help of simple examples, it will be possible to understand the notions of “chaotic” systems and of “complexity”.

Course Contents in brief:

- Introduction to discrete dynamical systems and ergodic theory.
- Measures of “chaos”: notions of entropy, Lyapunov exponents, algorithmic information content.
- Random perturbations of dynamical systems.

Total # of hours of lecture: 20

References:

- [1] Note del docente <https://pagine.dm.unipi.it/bonanno/Compiti/notecci.pdf>
 - [2] M. Brin, G. Stuck, “Introduction to dynamical systems”, CUP
 - [3] Y. Kifer, “Random perturbations of dynamical systems”, Birkhauser
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CV of the Teacher

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Room and Schedule

Room: *Aula Riunioni del Dipartimento di Ingegneria dell'Informazione, Via G. Caruso 16, Pisa – Ground Floor*

Schedule: Secondo semestre 13-17 maggio 2024

- 13/05/2024: 9:00 - 13:00
- 14/05/2024: 9:00 - 13:00
- 15/05/2024: 14:00 - 18:00
- 16/05/2024: 14:00 - 18:00
- 17/05/2024: 9:00 - 13:00