



Where:

In person in Classroom Ricamo A.0.6, University of L'Aquila and **Online** course (Microsoft Teams code uro2xgs)

When:

Lec. 1 Thursday,
Jan. 29, 11:00-13:00
Lec. 5 Friday,
Feb. 13, 14:30-16:30

Lec. 2 Friday,
Jan. 30, 11:00-13:00
Lec. 6 Tuesday,
Feb. 17, 14:30-17:30

Lec. 3 Tuesday,
Feb. 10, 9:00-11:00
Lec. 7 Friday,
Feb. 20, 9:00-11:00

Lec. 4 Thursday,
Feb. 12, 9:00-11:00

Abstract: One classical problem in many applied fields of research, like Geophysics, Medicine, Engineering, Economy, and Finance, is, given a signal, how to extract hidden information and features contained in it, like, for instance, quasi-periodicities and trends. Standard methods like Fourier and Wavelet Transform, historically used in signal processing, proved to be limited when nonlinear and nonstationary phenomena are present. For this reason, in the last two decades, several new nonlinear methods have been developed by many research groups around the world and they have been used extensively in the applications.

In this course, we will review the Empirical Mode Decomposition method and derived techniques and introduce the Iterative Filtering technique and its generalizations. We will discuss their theoretical and numerical properties, show their limitations, and discuss open problems.

During the course, some applications will be presented as well as an introduction to the Matlab codes available online.