# ECE 1511, "Signal Processing", Fall 2023

# Term Project

## "The Empirical mode decomposition (EMD): Algorithmic implementation and usage in applications"

The objective of this project is to implement and use the Empirical mode decomposition method (EMD) for analysis of a time series.

Your overall task will be to search the literature, implement, verify and test one of the versions (e.g 1D or 2D or bivariate) of the EMD algorithm and then use it to analyze and solve a signal processing problem of your choice. In particular, the tasks to be performed are as follows:

1. Do your own literature review, Download and read literature regarding definitions and implementations of the EMD algorithm (hree relevant papers are attached)
2. Implement your own or download (if available) an EMD Algorithm. Test the algorithm by repeating and confirming already existing results in the literature.
3. Based on your literature review and your own background or research interests, devise your own signal processing problem to solve. Devise a method and approach to use the EMD algorithm for solving this problem.
4. Evaluate your methodology and compare whenever appropriate to the performance of the methodology(ies) currently used to solve this problem. You may need to refine your method or perhaps try different variations. The objective is to improve performance if possible.
5. Prepare a report on your method similar to a conference paper with a length of approximately 15-20 single column pages.

Your project will be carried out in groups of two or individually. Please, provide me with the topic of your investigation (one page description) by the end of October 2023. A presentation of your project will be scheduled during the last two lectures of the term. The objective of the presentation is to give you a chance to present your method, identify problems and challenges and get feedback from the class. Your final project paper is due one week after your presentation.