

A machine learning approach for gravitational waves searches associated with pulsar glitches

Alicia Calafat¹, David Keitel¹, and Alicia M. Sintes¹

¹ Departament de Física, Universitat de les Illes Balears, IAC3 – IEEC, Carretera Valldemossa km 7.5, E-07122 Palma, Spain

Abstract

In gravitational-wave research, machine learning approaches sometimes struggle to match the sensitivities achieved in optimized pipelines. However, certain areas in gravitational-wave astrophysics pose challenges for conventional methods due to high computational costs or imprecise signal models. In these instances, machine learning emerges as promising avenue, offering a feasible approach. In this presentation, I will first explain the case of gravitational waves searches for glitching pulsars, and then I will focus into a pilot study using convolutional neural networks to analyze them. The study is built upon Albus, a machine-learning algorithm developed originally for minute-long gravitational wave burst. By showcasing this research, the poster aims to highlight the immediate prospects of machine learning as viable approach in unlocking new realms of discovery withing gravitational-wave and pulsar astrophysics.

My poster in zenodo.org can be found here