ML4CPD

Application of novel machine learning techniques for highly sensitive cryogenic particle detectors

Programm / Ausschreibung	FORPA, Forschungspartnerschaften NATS/Ö-Fonds, FORPA OEF2019	**Status**	abgeschlossen
Projektstart	01.07.2020	**Projektende**	30.06.2023
Zeitraum	2020 - 2023	**Projektlaufzeit**	36 Monate
Keywords	Sensors, Machine Learning, Control Theory, Data Analysis, Cryogenic Detectors		

Projektbeschreibung

Goal of the project is to employ novel machine learning techniques for highly sensitive cryogenic detectors which are used for the dark matter experiments CRESST and COSINUS and the neutrino experiment NUCLEUS. The project factorizes into two distinct tasks: the aim of the first task is to develop, implement, and study an optimal event classifier and regressor for the experiment.
The second task is an optimal control problem: the operation of the sensors will be optimized by a machine learning algorithm to maximize the sensitivity of the experiments which is driven by the signal-to-noise ratio of the sensors and their stability over time.

Projektpartner

- Österreichische Akademie der Wissenschaften MBI - Marietta-Blau-Institut für Teilchenphysik der Österreichischen Akademie der Wissenschaften