

EXTRA PROJECT (15 ECTS) – *Deep learning classifiers for 3D airspace surveillance radars*

Keywords: deep learning, temporal series analysis, radar target classification, drones

In emerging airspace surveillance applications, 3D radars are used to provide tracks of airborne detected targets. The use of effective techniques to automatically classify the different targets such as drones, birds, and airplanes is a very challenging requirement of a wide variety of stakeholders and potential end-users. Specific use-cases range from the protection against possible drone attacks to the use of commercial drones for package delivery or the protection of birds in wind farms.



In this extra project, you will investigate how to apply deep learning models on real track data acquired by high-resolution 3D radars in different environments to perform automatic target classification. The work includes research on the latest advances in deep learning models for time series classification and performance evaluation of different architectures. The activities comprise:

- Data exploratory analysis of real tracks data from 3D high-resolution radars.
- Review of literature in radar classification using deep learning.
- Review of state-of-the-art deep learning models for time series classification.
- Custom design of deep learning architectures for time series classification
- Train and evaluate the performance of selected models with real radar data.

You should have some background in radar signal/data processing and good knowledge of deep learning for classification. You should have some experience in Python programming for data analysis and deep learning methods. Above all, you must be interested in the topic and willing to learn something new and push knowledge boundaries.

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