

# Monitoring and Mitigation of RFI in Radio Astronomy Using Artificial Intelligence

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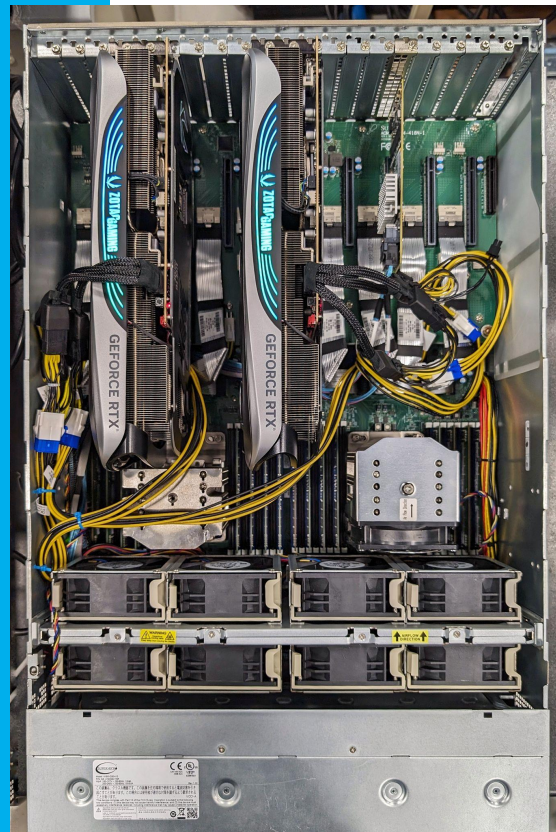
Total Funds: 20.000 €

# Deep learning workstation

A workstation dedicated to Deep Learning model training has been set up for remote usage with Jupyter/Google Colab. The machine is equipped with the purchase of two GPUs to accelerate the training process. The main configuration includes:

- Linux Operating System: The workstation uses the Linux operating system for enhanced flexibility and compatibility with tools and libraries commonly used in the fields of Machine Learning and Deep Learning;
- Remote Usage with Jupyter Notebooks: Users can remotely access the workstation through Jupyter notebooks. These notebooks run in Docker containers, isolated from the operating system, ensuring a clean and separate development environment. Users can execute their machine learning code in these containers without worrying about conflicts with other applications or services running on the workstation.
- To further streamline the process, the running containers come pre-installed with common dependencies for use with the Keras/Tensorflow framework.

**Funds spent: 4.557,92€**



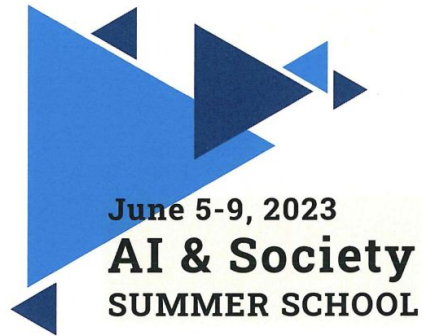
# Adaptive beamforming for PAF receivers



- The project on adaptive RFI mitigation for PAF receivers was presented at the URSI GASS 2023 conference held in Sapporo, Japan, and published by IEEE as:  
"Status of a C-band Phased Array Feed with RFSoc digital beamformer,"  
2023 XXXVth General Assembly and Scientific Symposium of the International Union of Radio Science (URSI GASS), Sapporo, Japan, 2023, pp. 1-4, doi: 10.23919/URSIGASS57860.2023.10265543.
- Currently, the project is in the phase of studying the state of the art. However, international partners have been identified who are willing to share a dataset, which is crucial to initiate the software development phase.

**Funds spent: 2.770,06€**

# AI & Society Summer School



The outcome of the participation was the presentation of a poster and training on topics related to Continual Learning (CL). In the context of on-site RFI monitoring, there is a need to address the constant evolution of interferences. The use of CL methodologies allows for real-time or periodic model updates with new data to ensure an accurate representation of the changing observed conditions. This is of paramount importance to ensure that the model remains sensitive to new radio interferences and can promptly identify them as anomalies.

**Funds spent: 703,64€**