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# Deep Neural Networks for detection of sources in radio astronomical maps: main challenges and current achievements.

Renato Sortino<sup>\*1</sup>, Daniel Magro<sup>\*2</sup>, Carmelo Pino<sup>1</sup>, Eva Sciacca<sup>1</sup>, Simone Riggi<sup>1</sup>, and Giuseppe Fiameni<sup>3</sup>

<sup>1</sup>INAF - Osservatorio Astrofisico di Catania – Italy

<sup>2</sup>University of Malta [Malta] – Malta

<sup>3</sup>NVIDIA AI Technology Centre – Italy

## Abstract

The analysis of SKA data precursors has been a valuable test bench for existing source finders, highlighting what limitations and improvements are to be made for the future survey program. Among them, reducing the false detection rate, particularly in the Galactic plane, and the ability to associate multiple detected islands into physical objects. To bridge this gap, we are developing new source finders, based on deep learning frameworks (e.g. Mask R-CNN and Tiramisu), capable of both detecting, classifying, and segmenting compact sources, radio galaxies, and imaging sidelobes in radio images. The models were trained on a custom dataset containing images from ASKAP EMU observations (Early Science fields and pilot survey) and previous radio survey data. The main challenges and current results obtained for the aforementioned methods will be presented at the conference including also the ongoing activities for optimization and improvements.

**Keywords:** radio astronomy, source finding, deep learning, object detection, semantic segmentation, SKA

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\*Speaker