

DYNAMIC RESOURCE ALLOCATION IN A MULTI-ROLE OR MULTI-FUNCTION SYSTEM

Main Technological Area → Telecommunications

Keyword → Radar | EMPAR | Multi-role | Multi-function | Optimization | Scheduling | Electronic Warfare | Antenna

Dynamic allocation of antenna resources plays a very important role when operating a RADAR system, as it allows it to also perform other functions (eg Communications, Electronic Warfare) within a multi-mission system. The invention allows allocation and sharing of subarray elements of an antenna, in order to obtain optimal system performance both in terms of hardware and software.

TECHNICAL SPECIFICATIONS

The patent describes a method of allocating resources to perform the antenna functions required by a multi-role or multi-function system, for which it is envisaged that the phased-array antenna can be used for activities that are also different from those of RADAR, typically for communications and electronic warfare.

An example of this kind of phased-array antenna is featured in the known multi-function system called EMPAR (European Multifunctional Phased-Array RADAR), which works in combination with a control system that allows the radiant elements of the RADAR unit to generate an electronic beam that performs an electronic scan; this scan is able to execute multiple functions, such as for example air-surveillance, target tracking or missile guidance.

The method, operating in a dynamic way, combines three resource allocation techniques: time-sharing, antenna-sharing and frequency-sharing, highlighted in the diagram of Figure 1. The first technique determines how much time will be taken up by resources for each function by allocating time slots; the second one determines which resources of antenna (subarray) will be affected by each function (in terms of position and pointing direction) and therefore allocated accordingly. The third technique determines, for each resource to be allocated, the working frequency so as to optimize subarray usage if different functions are performed on the same frequency band.

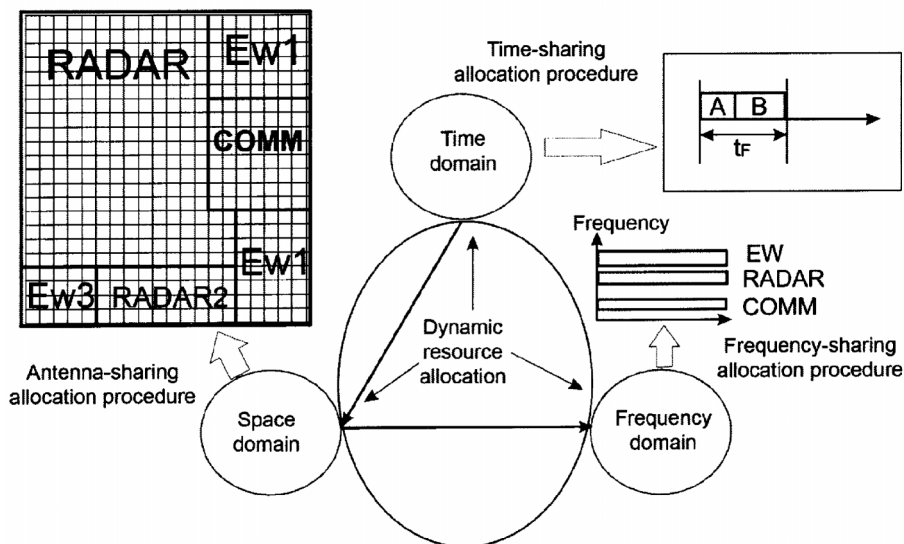


Figure 1 – Resource allocation: functional diagram

INNOVATION/ADVANTAGES

- The combined use of these allocation techniques, applied on the basis of parameters determined by the specific functions to be performed (priority, temporal compatibility, expected performance), allows an automatic resource planning based on the needs of the multi-role / multi-function system.

FIELDS OF APPLICATION

Radar	Air surveillance Target tracking Missile control
Telecomunicazioni	Electronic warfare SIGINT Wireless networking (e.g. Antenna diversity)

PATENT INFORMATION

Priority Date – 22/11/2010

Priority Code - IT2011TO1074A1

IPC Codes – G01S 2013/35, G01S 2013/0272, H01Q 3/30

Active worldwide applications

ITALY - TO2011A001074; **filing date**: 22/11/2011; **grant date**: 08/08/2014

EPO - EP2643885; **filing date**: 22/11/2011; **grant date**: 07/03/2018

Romania - Germany - France – United Kingdom

UNITED STATES OF AMERICA - US9046735; **filing date**: 22/11/2011; **grant date**: 28/03/2018

Leonardo internal code

LDO-0443