

Title (en)
METHOD, DEVICE AND COMPUTER PROGRAM PRODUCT FOR DETERMINING THE POSITION OF A SPACECRAFT IN SPACE

Title (de)
VERFAHREN, VORRICHTUNG UND COMPUTERPROGRAMMPRODUKT ZUR LAGEBESTIMMUNG EINES RAUMFLUGKÖRPERS IM WELTRAUM

Title (fr)
PROCÉDÉ, DISPOSITIF ET PRODUIT-PROGRAMME D'ORDINATEUR POUR DÉTERMINER LA POSITION D'UN ASTRONEF DANS L'ESPACE

Publication
EP 4204765 A1 20230705 (DE)

Application
EP 21769899 A 20210823

Priority
• DE 102020122748 A 20200831
• EP 2021073241 W 20210823

Abstract (en)
[origin: WO2022043247A1] The invention relates to a method for determining the position of a spacecraft in space, wherein the following steps are cyclically repeated: capturing distorted star images (4); processing the distorted star images (4) to form distorted star group data (6); storing the distorted star group data (6); determining a current rotation rate (8) by comparing the distorted star group data (6) of two consecutive cycles; transmitting the current rotation rate (8) to a position control system (9); and/or the following steps are carried out: processing the distorted star images (4) of a current cycle to form rectified star group data (11); determining position information (13) by matching the rectified star group data (11) with star group catalog data (14) which is carried along; transmitting the position information (13) to the position control system (9). The invention also relates to a method for determining the position of a spacecraft in space, wherein, on the basis of known system parameters of an optical system, the following steps are carried out: coding star group catalog data with $n = 3 \dots 4$ stars $[x_n, y_n, z_n]$, which are visible in a field of view, into representative focal-plane coordinates; forming a scaling-, translation- and rotation-invariant star group code on the basis of $[x_{PiX}, y_{PiX}]_n$; or the following step is carried out: coding star group catalog data with $n = 3 \dots 4$ stars $[x_n, y_n, z_n]$, which are visible in a field of view, into representative tangent and/or angular coordinates $[\tan(\alpha), \tan(\beta)]_n$. The invention further relates to a device for carrying out such methods and to a computer program product for carrying out such methods.

IPC 8 full level
G01C 21/02 (2006.01)

CPC (source: EP US)
B64G 1/361 (2013.01 - US); **B64G 1/369** (2023.08 - US); **G01C 21/025** (2013.01 - EP)

Citation (search report)
See references of WO 2022043247A1

Designated contracting state (EPC)
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)
BA ME

Designated validation state (EPC)
KH MA MD TN

DOCDB simple family (publication)
DE 102020122748 B3 20220210; EP 4204765 A1 20230705; JP 2023539615 A 20230915; US 2023331403 A1 20231019; WO 2022043247 A1 20220303

DOCDB simple family (application)
DE 102020122748 A 20200831; EP 2021073241 W 20210823; EP 21769899 A 20210823; JP 2023513655 A 20210823; US 202118043355 A 20210823