



## SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application number:  
EP 20 90 16 17

### Classification of the application (IPC):

G06T 17/10, G08G 1/04, G06T 7/30, G06T 7/70, G06V 20/56, G06T 17/00,  
G08G 1/14, G08G 1/017

### Technical fields searched (IPC):

G06V, G06T

DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
X A	US 2019139403 A1 (ALAM S M IFTEKHARUL [US] ET AL) 09 May 2019 (2019-05-09) * abstract; claim 1 * * paragraphs [0018], [0019], [0040], [0048], [0051] *	1-6, 8-15 7
X A	US 2019162856 A1 (ATALLA PETER [GB]) 30 May 2019 (2019-05-30) * abstract * * paragraphs [0038] - [0042], [0048] *	1-6, 8-15 7
X A	<b>SAARINEN JARI ET AL:</b> "Normal Distributions Transform Occupancy Maps: Application to large-scale online 3D mapping" <i>2013 IEEE INTERNATIONAL CONFERENCE ON ROBOTICS AND AUTOMATION (ICRA); 6-10 MAY 2013; KARLSRUHE, GERMANY, IEEE, US</i> , 06 May 2013 (2013-05-06), DOI: 10.1109/ICRA.2013.6630878, ISSN: 1050-4729, ISBN: 978-1-4673-5641-1, pages 2233-2238, XP032506447 * abstract; figure 4 *	1, 2, 4-6, 8-15 3, 7
A	WO 2018221453 A1 (PIONEER CORP [JP]) 06 December 2018 (2018-12-06) * abstract; figures 5A-6C * * paragraphs [0010], [0047] *	1-15
A	<b>MARTIN MAGNUSSON ET AL:</b> "Scan registration for autonomous mining vehicles using 3D-NDT" <i>JOURNAL OF FIELD ROBOTICS US</i> 01 January 2007 (2007-01-01), vol. 24, no. 10, DOI: 10.1002/rob.20204, ISSN: 1556-4959, pages 803-827, XP055646213 * abstract *	1-15

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

Place of search Munich	Date of completion of the search 22 November 2023	Examiner Rimassa, Simone
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### CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone	P: intermediate document
Y: particularly relevant if combined with another document of the same category	T: theory or principle underlying the invention
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& : member of the same patent family, corresponding document	L: document cited for other reasons

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
T	<p><b>CHEN JIAQI ET AL:</b> "3D LiDAR-Based Localization Methods: An Overview : Proceedings of 2022 International Conference on Guidance, Navigation and Control" , ADVANCES IN GUIDANCE, NAVIGATION AND CONTROL : PROCEEDINGS OF 2022 INTERNATIONAL CONFERENCE ON GUIDANCE, NAVIGATION AND CONTROL, SPRINGER NATURE SINGAPORE, SINGAPORE, 01 January 2023 (2023-01-01), pages 1624-1636</p> <p>URL: <a href="https://link.springer.com/10.1007/978-981-19-6613-2_159">https://link.springer.com/10.1007/978-981-19-6613-2_159</a> , DOI: 10.1007/978-981-19-6613-2_159 [retrieved on 31 January 2023 (2023-01-31)] XP009549959</p> <p>* the whole document *</p>	

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

Place of search Munich	Date of completion of the search 22 November 2023	Examiner Rimassa, Simone
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A: technological background	E: earlier patent document, but published on, or after the filing date
O: non-written disclosure	D: document cited in the application
& : member of the same patent family, corresponding document	L: document cited for other reasons

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## ANNEX TO SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application number:  
EP 20 90 16 17

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on 22-11-2023  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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		EP      3903293 A1	03-11-2021
		US      2019139403 A1	09-05-2019
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		JP      WO2018221453 A1	26-03-2020
		US      2020271454 A1	27-08-2020
		WO      2018221453 A1	06-12-2018