



## (51) International Patent Classification:

G01C 21/34 (2006.01)

## (21) International Application Number:

PCT/US2017/030940

## (22) International Filing Date:

04 May 2017 (04.05.2017)

## (25) Filing Language:

English

## (26) Publication Language:

English

## (30) Priority Data:

15/150,830 10 May 2016 (10.05.2016) US

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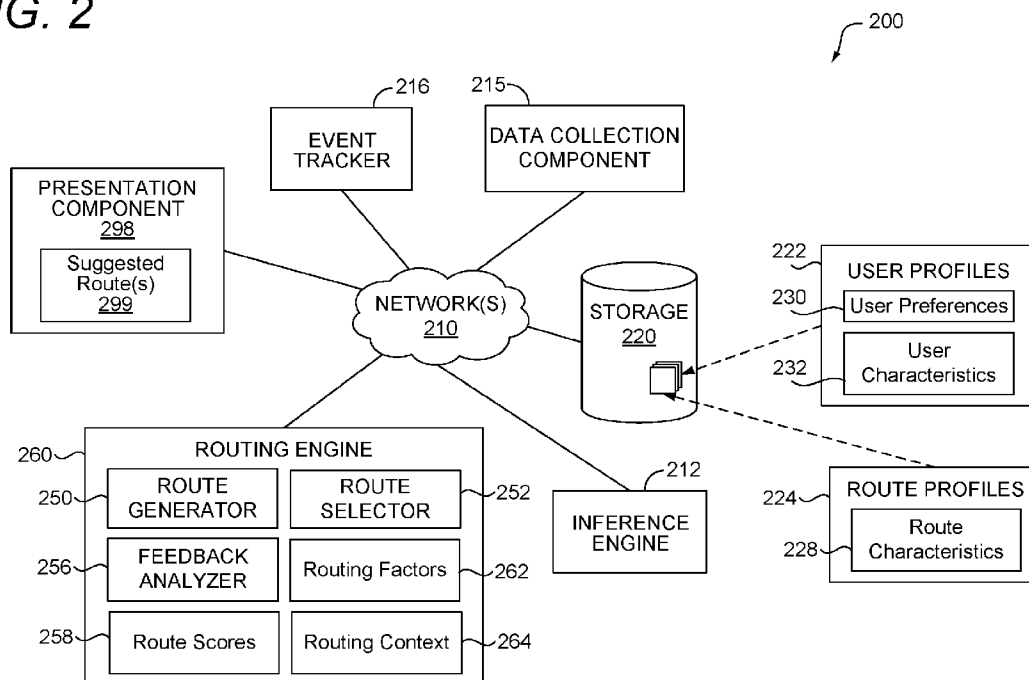
Docketing (Bldg. 8/1000), One Microsoft Way, Redmond, Washington 98052-6399 (US). **WEINBERG, Shira**; MICROSOFT TECHNOLOGY LICENSING, LLC, Attn: Patent Group Docketing (Bldg. 8/1000), One Microsoft Way, Redmond, Washington 98052-6399 (US). **BORSUTSKY, Yuval**; MICROSOFT TECHNOLOGY LICENSING, LLC, Attn: Patent Group Docketing (Bldg. 8/1000), One Microsoft Way, Redmond, Washington 98052-6399 (US). **COHEN, Avichai**; MICROSOFT TECHNOLOGY LICENSING, LLC, Attn: Patent Group Docketing (Bldg. 8/1000), One Microsoft Way, Redmond, Washington 98052-6399 (US).

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ,

(54) Title: ENHANCED USER EFFICIENCY IN ROUTE PLANNING USING ROUTE PREFERENCES

FIG. 2



(57) Abstract: In various implementations, routing factors are identified based on a routing request associated with a user, where the routing factors include route preferences of the user. Routes are generated based on the routing request. Preference weights are determined for the route preferences, where the preference weights correspond to machine learning models based on sensor data provided by one or more sensors in association with the user. Route scores are determined for the routes based on the preference weights. A suggested route is provided to a user device associated with the user, where the suggested route corresponds to a selected route of the routes and is provided based on the route score of the selected route.

CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

- (84) Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

**Declarations under Rule 4.17:**

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

**Published:**

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

**(88) Date of publication of the international search report:**

28 December 2017 (28.12.2017)

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2017/030940

### Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

### Box No. III Observations where unity of invention is lacking (Continuation of Item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

#### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☒ No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2017/030940

A. CLASSIFICATION OF SUBJECT MATTER  
INV. G01C21/34  
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
G01C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EP0-Internal, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                                                       | Relevant to claim No. |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Y         | US 7 512 487 B1 (GOLDING ANDREW R [US] ET AL) 31 March 2009 (2009-03-31)<br>figures 1, 4a, 4b<br>column 2, lines 49-60<br>column 5, lines 20-66<br>----- | 1-15                  |
| Y         | DE 10 2009 047377 A1 (BOSCH GMBH ROBERT [DE]) 9 June 2011 (2011-06-09)<br>paragraphs [0010], [0011]<br>-----                                             | 1-15                  |
| Y         | US 2015/160026 A1 (KITCHEL DAVIS [US])<br>11 June 2015 (2015-06-11)<br>the whole document<br>-----<br>-/--                                               | 3                     |



Further documents are listed in the continuation of Box C.



See patent family annex.

\* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

1 November 2017

Date of mailing of the international search report

09/11/2017

Name and mailing address of the ISA/

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Authorized officer

Kuhn, Robert

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2017/030940

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                                                   | Relevant to claim No. |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Y         | WO 2010/040386 A1 (TOMTOM INT BV [NL];<br>LUKASSEN ROBERT [NL])<br>15 April 2010 (2010-04-15)<br>page 13, line 24 - page 16, line 6;<br>figures 6, 7 | 4                     |
| Y         | -----<br>DE 10 2014 008151 A1 (DAIMLER AG [DE])<br>3 December 2015 (2015-12-03)<br>the whole document<br>-----                                       | 6                     |

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2017/030940

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
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| US 7512487 B1                             | 31-03-2009          | US 7512487 B1              | 31-03-2009          |
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| DE 102014008151 A1                        | 03-12-2015          | NONE                       |                     |
| -----                                     |                     |                            |                     |

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1, 2, 7, 8, 13-15

selection of a suggested route based on a comparison between an estimated time to travel over a suggested route or a total distance of the suggested route and a threshold value based on a reference route

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2. claims: 3, 4, 10-12

identification of specific route preferences

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3. claims: 5, 9

determination of a route score based on conditions or subscores of route components

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4. claim: 6

output of a suggested route to a user in a specific format or to a computer-controlled transportation vehicle

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