Title: METHOD AND SYSTEM FOR FINDING NEAREST NEIGHBORS BASED ON VORONOI DIAGRAM

Abstract: Disclosed are a method and system for finding nearest neighbors based on a Voronoi diagram. The method includes maintaining boundary minimum distance information including a minimum distance matrix between boundary points of Voronoi cells, in an entire road network adopting the Voronoi diagram, retrieving a predetermined number of nearest neighbors corresponding to an arbitrary query point using the boundary minimum distance information, and providing a POI corresponding to the retrieved nearest neighbors with respect to the query point.

FIG 6

START

RETRIEVE VORONOI CELL INCLUDING QUERY POINT AS A VORONOI CELL

YES

NO

RETRIEVE VORONOI CELL, ADJACENT TO VORONOI CELL INCLUDING QUERY POINT, BASED ON BOUNDARY MINIMUM DISTANCE INFORMATION

RETRIEVE MINIMUM DISTANCE (B) BETWEEN VORONOI CELL INCLUDING QUERY POINT AND BOUNDARY POINT OF ADJACENT VORONOI CELL

RETRIEVE MINIMUM DISTANCE (C) BETWEEN BOUNDARY POINT OF ADJACENT VORONOI CELL AND POI OF ADJACENT VORONOI CELL BASED ON CELL MINIMUM DISTANCE INFORMATION

CALCULATE MINIMUM DISTANCE TO POI FROM QUERY POINT USING PREVIOUSLY CALCULATED MINIMUM DISTANCE BETWEEN CELL

RETRIEVE POIs HAVING SHORTEST DISTANCE IN MINIMUM HEAP, POI BEING THE NEXT NEAREST NEIGHBOR

RESULT IS NUMBER OF POI IDENTICAL TO \( k \)

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

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A. CLASSIFICATION OF SUBJECT MATTER

G01C 21/34(2006.01)i

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)

IPC 8: G01C, G06F, G08G

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

Korean utility models and applications for utility models since 1975

Japanese utility models and applications for utility models since 1975

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

eKIPASS (KIPO internet) & Keywords: "voronoi", "nearest neighbor", "POI", and "search"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<tr>
<td>A</td>
<td>JP 2001-093077 A (FUJITSU LTD.) 06 APRIL 2001 See the whole document.</td>
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<td>US 04862373 A (Alex C-C Meng) 29 AUGUST 1989 See the whole document.</td>
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Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:

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Date of the actual completion of the international search

15 DECEMBER 2008 (15.12.2008)

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