SLOVENSKI STANDARD
SIST EN ISO 17419:2018/oprA1:2023

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Inteligentni transportni sistemi - Kooperativni sistemi - Globalna enotna identifikacija - Dopolnilo 1: Območja zaprtega mnogokotnika v ravnini (ISO 17419:2018/DAM 1:2023)

Intelligent transport systems - Cooperative systems - Globally unique identification - Amendment 1: Regions of a closed polygon in a plane (ISO 17419:2018/DAM 1:2023)

Intelligente Verkehrssysteme - Kooperative Systeme - Global eindeutige Identifikation - Ergänzung 1 (ISO 17419:2018/DAM 1:2023)

Systèmes intelligents de transport - Systèmes coopératifs - Identification unique au niveau global - Amendement 1: Régions d'un polygone fermé dans un plan (ISO 17419:2018/DAM 1:2023)

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DRAFT AMENDMENT
ISO 17419:2018/DAM 1

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Intelligent transport systems — Cooperative systems — Globally unique identification

AMENDMENT 1: Regions of a closed polygon in a plane

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This document was prepared by ISO/TC 204, *Intelligent transport systems*.

Amendment 1 provides the specification of a closed polygon in a plane and its associated inner and outer areas.

Intelligent transport systems — Cooperative systems — Globally unique identification

AMENDMENT 1: Regions of a closed polygon in a plane

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Clause 6.9.4

Insert after the bullet list the following paragraph:

> The definition of regions, i.e. areas, associated with a closed polygon shall be as specified in Annex C.

Add the following annex before the Bibliography

Annex C
(normative)

Closed polygons and their associated regions

A.1 Closed polygon in a two-dimensional Euclidean space

A closed polygon in a two-dimensional Euclidean (or flat) space is an object consisting of an ordered set of N>2 straight line segments, referred to as edges E_i , i = 1, …, N, or sides, connected such that no two segments intersect (or cross), and such that the first and last edges in the set share and end-point. An end-point of an edge is referred to as vertex.

Assuming that associated with the two-dimensional (2-D) space is a two- dimensional or three-dimensional coordinate system for expressing points in that 2-D space, an equivalent description is as an ordered set of N coordinate points P_i, i = 0, …, N-1, referred to as vertices, with edges having adjacent vertices as end-points noting that the first and last vertices are considered as being adjacent.

Finally, noting that closed polygons divide the 2-D space, which in general is infinite, into two non-intersecting subspaces, means for uniquely identifying and labeling the two subspaces, also referred to as two regions or two areas, are necessary. To accomplish this, directed edges are defined such that each edge E_i has a “tail”, the (i-1)-th vertex P_{i-1} in the ordered list, and a “head”, the i-th vertex P_i for i= 1, …, N-1, with the N-th directed edge having its tail as the vertex P_{i-1} and its head as the vertex P_0 as shown in Figures C.1 and C.2.

Also, in order to be able to use the concepts of “right” and “left” to identify the regions (areas) and noting that a 2-D plane divides the 3-D space into two 3-D half-spaces, the particular half-space from which the 2-D plane is being viewed must be specified. Since most all the regions relevant to ITS are relative to the surface of the earth, it is convenient to think of the 2-D space as being (nearly) parallel to that surface and viewing the polygon in that space from “above”, i.e., from outside the earth, and that is the convention that shall be applicable herein.

NOTE 1 Future versions of this Annex may expand from 2-D Euclidean spaces (planes) with 2-D manifolds to 3-D objects such as ellipsoids or geoids in which case the specification of which 3-D region is used as the viewpoint is straightforward since there is an obvious “inside” and “outside” of the object.

NOTE 2 Future versions of this Annex may provide for different edge definitions such as “constant-bearing”, “constant-latitude/longitude”, “geodesic”, etc..

NOTE 3 For the purposes of calculating whether a given point in 3-D space is in the right or left region, the polygonal region is assumed to be planar and an orthonormal projection onto that plane is performed. If the specified vertices of the polygon do not all lie in a common plane such as may be the case for a large geographic region whose vertices are given in latitude, longitude and possibly altitude coordinates, the vertices need to be projected onto a common plane to ensure the polygonal region is planar.

A.2 Right and left regions of a closed polygon

Closed polygons as defined herein specify two regions: a “right region" ("R") and a “left region" ("L"). Standing at the tail of a directed edge and looking at the head of that same directed edge, the "right region" shall be to the right and the "left region" shall be to the left. All regions specified using closed polygons shall be the "right regions" thereof.

For example, an ITS regulatory region as described in 6.9.4 is specified by the "right region" of a closed polygon. The order of the vertices of that closed polygon determine whether the "right region" is the interior or the exterior of the closed polygon as shown in Figures C.1 and C.2. By reversing the ordering of the vertices (equivalently the direction of the edges), the interior of the closed polygon changes from

being a "right region" ("R") to being a left region ("L"), and consequently the ITS regulatory region changes from being the interior to being the exterior of the closed polygon.