CARPATHIAN J. MATH. Online version available at http://carpathian.ubm.ro
32 (2016), No. 1, 49 - 62 Print Edition: ISSN 1584 - 2851 Online Edition: ISSN 1843 - 4401

Systems of knowledge representation based on stratified graphs. Application in Natural Language Generation

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Abstract.

The concept of stratified graph introduces some method of knowledge representation (see [Ţăndăreanu, N., *Knowledge representation by labeled stratified graphs*, Proc. 8th World Multi-Conference on Systemics, Cybernetics and Informatics, **5** (2004), 345–350; Ţăndăreanu, N., *Proving the Existence of Labelled Stratified Graphs*, An. Univ. Craiova Ser. Mat. Inform., **27** (2000), 81–92]) The inference process developed for this method uses the paths of the stratified graphs, an order between the elementary arcs of a path and some results of universal algebras. The order is defined by considering a structured path instead of a regular path. In this paper we define the concept of *system of knowledge representation* as a tuple of the following components: a stratified graph $\mathcal{G}$, a partial algebra Y of real objects, an embedding mapping (an injective mapping that embeds the nodes of $\mathcal{G}$ into objects of Y) and a set of algorithms such that each of them can combine two objects of Y to get some other object of Y. We define also the concept of *inference process* performed by a system of knowledge processing in which the interpretation of the symbolic elements is defined by means of natural language constructions. In this manner we obtained a mechanism for texts generation in a natural language (for this approach, Romanian).

Acknowledgement.
This work was supported by the strategic grant POSDRU/159/1.5/S/133255, Project ID 133255 (2014), co-financed by the European Social Fund within the Sectorial Operational Program Human Resources Development 2007-2013.

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Received: 29.10.2014; In revised form: 01.02.2015; Accepted: 26.11.2015
2010 *Mathematics Subject Classification.* 05C20, 18A10, 68T30.
Key words and phrases. *Peano algebra, labeled graph, stratified graph, morphism of partial algebras, structured path, accepted structured path, inference process.*
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