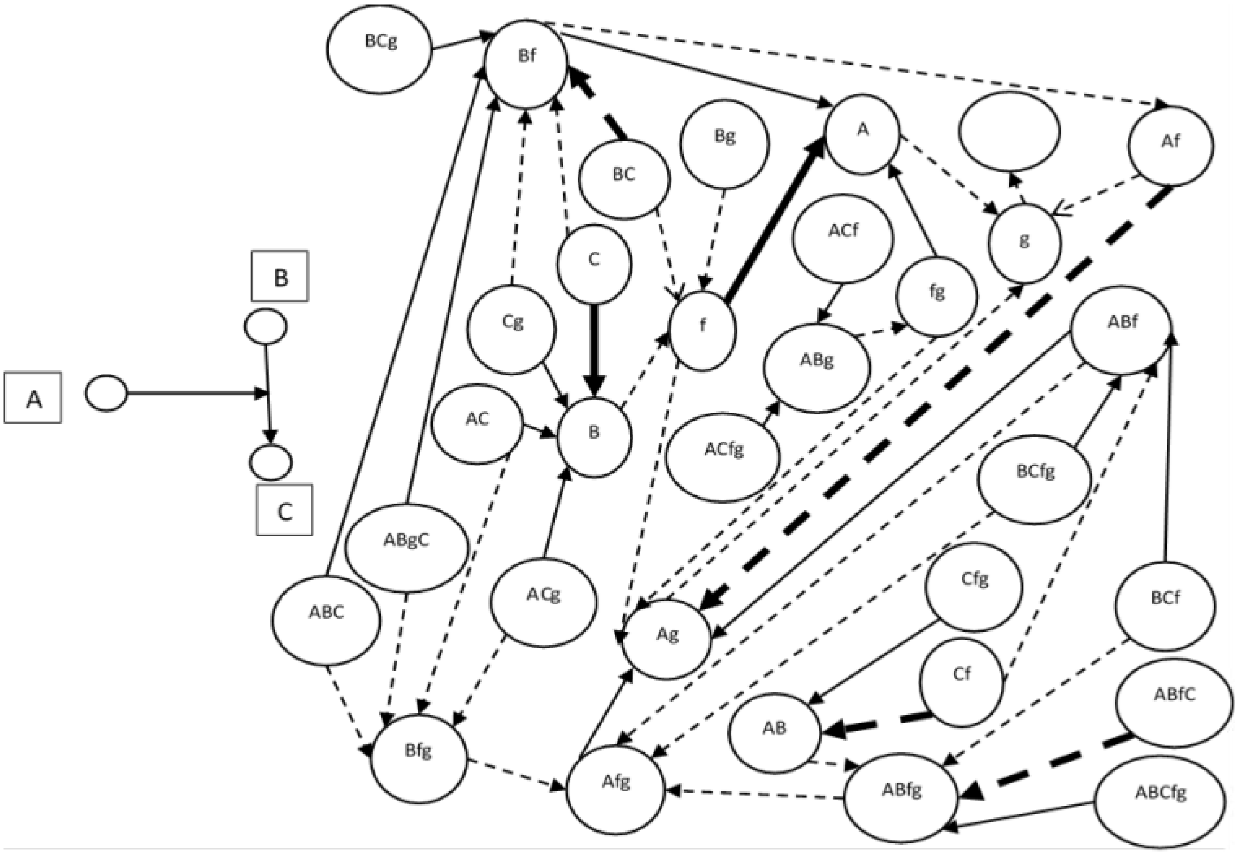

Figure 7: Asymmetric ontological structure with corresponding dynamic structure.

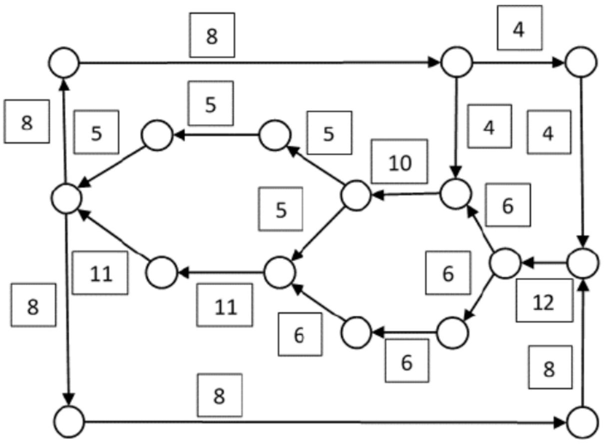

Figure 8: Strong connected orgraph backward flow.

dographs.

Sensors (receptors) are acyclic subgraphs whose elements are not reachable from any resonator.

Dispensers (effectors) are acyclic subgraphs whose elements are not reachable from any resonator.

Transmitters are acyclic subgraphs whose elements are reachable from at least one resonator and from whose elements at least one other (different) resonator is reachable.

Transmitters and transmitters are consumers.

Sensors and transmitters are suppliers.

We can also consider generating resonators (not reachable from other resonators) and consuming resonators (reachable from other resonators).

Among resonators, we can distinguish unimodal (harmonic) resonators and multimodal (nonharmonic) resonators (multimodal waveform). All multimodal resonators are consuming resonators. Each mode is phase shifted by less than a period.

A resonator-free subgraph can be extracted from any structure, which is the set of all vertices and edges reachable from the receptor elements.

The remaining edges together with their initial and final vertices form the resonator subpseudograph.

A receptor element is called a sensor element if it has no supplier.

A dispenser element is called a dispenser element if it has no consumer.

If there are no suppliers (sensors or transmitters) whose elements are suppliers to the generating resonator, then all its elements are sensor elements.

If there are no consumers (dispensers or transmitters) whose elements are consumers of the resonator, then all its elements are dispenser elements.

The method for determining the capacitive characteristics of structures used in problem solving is summarized in the following principles.

Each resonator has a period, which is the partial GCD T of its own period and periods of all (its) suppliers, from which it consumes, to the GCD of this GCD (T) and all its divisors k, for which the convolution of the phases $k*n$ with the phases (taking into account their shifts) of all modes (waveforms) of the signal is equal to $kT - k * ((T - k)!)$.

For each consumer (dispenser or transmitter) element, the period is calculated similarly, except that instead of the GCD of the period itself and the periods of all (its) suppliers from which it consumes, the GCD of the periods of all its suppliers is taken.

For each supplier element, the potential period, which is the period of the consumer in the inverted pseudograph (inverse ratio pseudo-graph), can be similarly determined.

For sensor elements, it may be assumed, unless otherwise accepted, that their period is equal to their potential period.

For each sensor element (supplier), a period can be calculated that is equal to the LCM of the periods of all its consumers (taking into account the phase shift).

The entropy of a set of resonators is calculated on a period equal to the GCD of periods of all resonators of this set.

If resonators are present, then the (maximum possible) entropy of the entire pseudograph is valid and can be computed as the greatest entropy of the greatest entropy of the greatest entropies of the smallest sets of resonators cutting the set (paths) of the set of smallest sets of paths connecting all sensor elements to all dispenser elements.

If all sensor elements and dispenser elements are resonator elements, then the (minimum required) entropy of the entire pseudograph is valid and can be computed as the smallest entropy of the smallest entropies of the smallest sets of resonators cutting the set (paths) of the set of smallest sets of paths connecting all sensor elements to all dispenser elements.

If all sensor elements and dispenser elements are not resonator elements, then the (minimum necessary) entropy of the whole pseudograph is invalid (imaginary) and is computed on the period equal to the LCM of all periods (elements) of the subpseudographs of the pseudograph and the maximum of the lengths of the (simple) paths from the sensor element to the dispenser element.

The entropy of an unbound pseudograph can be calculated as the average (minimum, maximum, etc.) of the entropies of its components on a period equal to the LCM of periods (on which calculations for) its components were performed.

Conclusions

The classification of enumerable finite structures and their representations is proposed, relations between classes of this classification are considered. The classification is oriented on unification of knowledge representation with finite structure and algorithmization of solutions of problems of investigation of topological and metric properties of structures of meaning space in order to exclude redundant fragments of knowledge at representation in meaning space.

Approaches are considered and concepts for investigation of structural-topological and metric properties of structures of the sense space for the purpose of optimization of structures of knowledge bases are proposed.

General quantitative evaluations of mappings of finite structures with accuracy up to order preservation to ordinal and metric scales in the study of corresponding properties of these structures are given. An approach to the classification of quantitative features of finite structures is proposed. An algorithm for metric computation on the union of extensional closures of sense space concepts is proposed.

A model and a method for computing entropy (as one of the invariants) for finite dynamic structures of information processing models (in accordance with the models of graph dynamical system and generalized finite automaton [64]) based on analytical calculation of transition probabilities on the state graph in accordance with its structure are proposed.

The features of structures of semantic space that can be used as invariants in order to reduce the time to identify redundant fragments in the semantic space are considered.

A model of operational-information space is proposed, which corresponds to the model of model-parametric space [67], is oriented to solving the problems of knowledge management [15], [50], [56] in information processing and the study of the relationship between the attributes of structures with operational semantics expressed by the operational semantics of small and large step.

An approach to the consideration of infinite structures through (limit) sequences of finite structures converging to them is proposed in accordance with the classification of finite structures, the model of knowledge specification [5], the algebraic system of extensible sets and the metamodel of semantic space [56].

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