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Domain and function: a dual-space model of semantic relations and compositions. (English)
Zbl 1280.68273

Summary: Given appropriate representations of the semantic relations between carpenter and wood and between mason and stone (for example, vectors in a vector space model), a suitable algorithm should be able to recognize that these relations are highly similar (carpenter is to wood as mason is to stone; the relations are analogous). Likewise, with representations of dog, house, and kennel, an algorithm should be able to recognize that the semantic composition of dog and house, dog house, is highly similar to kennel (dog house and kennel are synonymous). It seems that these two tasks, recognizing relations and compositions, are closely connected. However, up to now, the best models for relations are significantly different from the best models for compositions. In this paper, we introduce a dual-space model that unifies these two tasks. This model matches the performance of the best previous models for relations and compositions. The dual-space model consists of a space for measuring domain similarity and a space for measuring function similarity. Carpenter and wood share the same domain, the domain of carpentry. Mason and stone share the same domain, the domain of masonry. Carpenter and mason share the same function, the function of artisans. Wood and stone share the same function, the function of materials. In the composition dog house, kennel has some domain overlap with both dog and house (the domains of pets and buildings). The function of kennel is similar to the function of house (the function of shelters). By combining domain and function similarities in various ways, we can model relations, compositions, and other aspects of semantics.

MSC:

68T50	Natural language processing	
68Q55	Semantics in the theory of computing	

Cited in **3** Documents

Full Text: DOI