

<<情境中的模糊计算本体>>

图书基本信息

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内容概要

计算本体(computational ontology)是对概念以及概念间的各种关系的一种形式化表述,是知识表示、语义网、智能主体等人工智能主要研究领域中的重要研究对象。

本书提出了一个基于模糊集的、可表达对象对于概念的归属程度(object membership)和对象在概念中的典型程度(object typicality)的形式化计算本体模型,以具体例子论证了此形式化模型的必要性和重要性;指出了情境(context)对物体归属程度和典型程度的影响,并对此加以形式化;最后讨论了此形式化模型在推荐系统中的应用,用实验证明利用对象典型程度,或把对象典型程度加到协同过滤法后,能进一步提高模型的准确性。

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章节摘录

版权页：插图：From this description, we notice that besides what we call vagueness in concepts, we also have another issue of whether an individual object is typical or not. For example, when we refer to concept 'bird', we may remind sparrows and eagles, which are typical instances of the concept 'bird'. and rarely remind penguins and ostrich, which are not typical instances of 'bird'. At first glance, such 'typicality' of individual objects in concepts can be treated in the same way as in the case of vagueness, and in fact they can be both modeled by fuzzy set theory or probabilistic theory in some previous works (e.g., [24, 25]). Most of the existing approaches only focus on the fuzziness or vagueness of concepts but not on this typicality effect of categorizations. In fact, fuzziness and typicality are actually intrinsically different aspects of concepts. As mentioned in Ref. [26], we can identify two types of measures of an individual object's membership in a concept, referring to fuzziness and typicality. That different individual objects have different degrees of typicality (or prototypicality) in a certain concept is actually first studied in the field of cognitive psychology [27-29]. As works in cognitive psychology suggest, typicality is more a psychological effect than an objective decision of an individual's membership grade in a concept. It is found out that typicality of objects depends on the match of necessary properties as well as non-necessary properties [28]. For example, robins are generally considered as more typical birds than penguins [28]. This is probably due to the fact that birds are generally considered to be able to fly, but penguins do not. Hence, we can see that this is very different from, say, how we judge a certain temperature as 'high' or not. Thus, typicality should be determined by a different mechanism from the one used to determine the fuzzy membership grade of an individual object. While it is desirable to model fuzziness of concepts in ontologies, the effect of typicality should not be overlooked. We believe that it is necessary to identify the differences between the two measures, so that we are able to come up with formal methods to model these two measures in ontologies.

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