

基于实例推理的铲式玉米精密播种机设计 Design Method of Precision Spade Punch Planter of Maize Based on CBR

杨宇 李成华 张国梁

沈阳农业大学

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摘要: 基于实例推理的基本原理, 针对传统案例属性相似度计算模型缺乏对不确定环境中不精确信息的适应性, 研究了最近邻实例检索过程中实例属性相似度的确定方法以及属性权重的组合计算, 提出检索过程中区间值属性相似度的计算模型和基于相似度离差信息的客观赋权方法。将实例推理技术应用在铲式玉米精密播种机的设计过程中, 采用IDEFO法对播种机设计任务进行分解, 采用最近邻实例检索策略完成实例检索并根据设计要求进行修整, 从而达到设计要求。运用Pro/E对设计方案进行三维造型并进行动态仿真, 验证了设计方案的有效性和可行性。 Traditional calculational models for similarities between case properties lack the adaptability to imprecision information in an uncertain environment, therefore, based on case-based reasoning (CBR) principle, and determination method for real case similarity and combined calculation method for properties weight were studied. A similarity computation model among interval value and an objective method based on the deviation information of similarity values among properties were proposed. CBR principle was applied in design of precision spade punch planter of maize. IDEFO method was adopted to disassemble design procedure. The nearest-neighbor case retrieval strategy was used to accomplish case retrieval. Then, the retrieved case was modified to meet the needs of the design. Three-dimensional parameterized model was developed, and dynamic simulation was carried out for design scheme by using Pro/E, which verified effectiveness and feasibility of the design.

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