Journal of Telecommunications System & Management

Abstract

A Rule-Based Two-Level Classification Approach for Recognition of Machining Features from 3D Geometric Models

Alan C. Lin and Riona Ihsan

National Taiwan University of Science and Technology, Taipei 106, TAIWAN

Abstract:

In this paper, a rule-based approach is presented to enhance the capability of recognizing both intersecting and isolated features with form variation. Features are recognized and classified into a two-level classification. In the first level, edge and loop types are utilized to categorize the features into two different groups, namely single-entry feature (SEF) and multiple-entry feature (MEF). In the second level classification, hole and pocket features can be recognized by either convex internal loops or concave external loops. Meanwhile, step and slot features can be recognized by hybrid loops and the total number of tool accessible directions. Besides, the transitional features are categorized into simple and rounded features according to surface types and the number of face sets. Non-planar surfaces including cylinder, sphere and cone are also examined. Finally, special machining features such as T-slot and dovetail slot are also evaluated by means of pre-defined rules.

The proposed approach has been implemented using NX Open in Siemens NX as the platform for system development. Five real industrial parts are used as test examples. The result shows that eighteen feature types are successfully recognized to accommodate intersecting and isolated machining features with variable topology.

Biography:

Alan C. Lin has completed his PhD at the age of 29 from Purdue University, Indiana, USA. He is currently Professor in the Department of Mechanical Engineering, Na-

tional Taiwan University

of Science and Technology, Taipei, TAIWAN. His research interests are CAD/CAM, Mold Design, Industrial Robots and Automation.

Publication of speakers:

1. Alan C Lin, PeerAppear: A distributed geospatial index supporting collaborative world model construction and maintenance, Future Generation Computer Systems, Volume 95, June 2019, Pages 802-815
2. Alan C Lin, Automatic generation of mold-piece regions and parting curves for complex CAD models in multi-piece mold design, Computer-Aided Design, Volume 57, December 2014, Pages 15-28
3. Alan C Lin, Parting curve selection and evaluation using an extension of fuzzy MCDM approach, Applied Soft Computing, Volume 13, Issue 4, April 2013, Pages 1952-1959
4. Alan C Lin, Probe-radius compensation for 3D data points in reverse engineering, Computers in Industry, Volume 48, Issue 3, August 2002, Pages 241-251

Citation: Alan C. Lin; A Rule-Based Two-Level Classification Approach for Recognition of Machining Features from 3D Geometric Models; Artificial Intelligence 2020; May 21, 2020; London, UK

J Telecommun Syst Manage
ISSN: 2167-0919

Volume 9 and Issue 4