

# DEVELOPMENT OF ONTOLOGY INFERENCE CLOUD SERVICE FOR MACHINE TOOLS

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**ABSTRACT:** This paper presents the design and implementation of an ontology-inference cloud service (OICS) for the CNC machine tool industry. The OICS is an ontology-inference-based recommendation system of machine tools and cutting tools. Four functional modules, i.e. ontology data maintenance module, inference rule maintenance module, ontology inference module, and cloud adaptor module, are designed in OICS, which allows the users to create ontology data and inference rules, perform inference service, and verify the recommended machine tools or cutting tools via VMT (Virtual Machine Tool) simulations. In addition, we adopt Service-Oriented Architecture (SOA) to build the OICS so that the users can easily access the OICS globally through the Internet. Finally, we deploy the OICS in a public cloud platform, namely Microsoft Windows Azure, and conduct integrated tests by following two scenarios of recommending proper CNC machine tools and cutting tools for a machining task to validate the efficacy of the developed OICS. The results in this paper provide a new paradigm of leveraging cloud computing and Ontology to build knowledge-inference systems for machine tools.

**Keywords:** Inference, Ontology, Machine-Tool, Cloud Computing, Service-Oriented Architecture.