

A Visual Concept Ontology For Automatic Image Recognition

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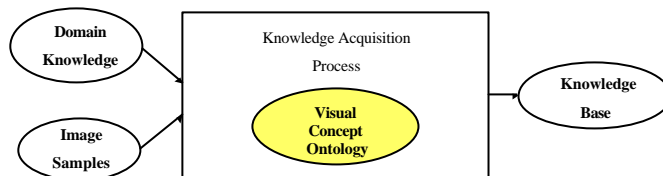
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Introduction

- Experts often use a well-defined vocabulary to describe the images of their domain (e.g. astronomy, palynology)
- We propose an ontology based knowledge acquisition process to perform this visual description
- This knowledge acquisition process is based on a visual concept ontology
- A Knowledge Acquisition Tool has been developed and applied to pollen grain description

keywords: Ontology, Data Semantics, User Interfaces

Approach



Visual Concept Ontology

The Ontology is structured in three parts :

- **Color** concepts
- **Texture** Concepts
- **Spatio-temporal** Concepts.
- **Context concepts** (e.g. point of view, acquisition sensor)

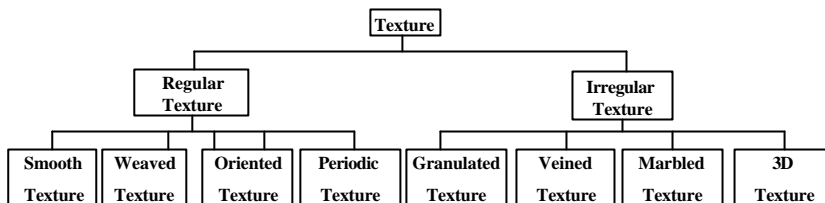
•Color Concepts (flattened view)

Derived from the ISCC-NBS color dictionary

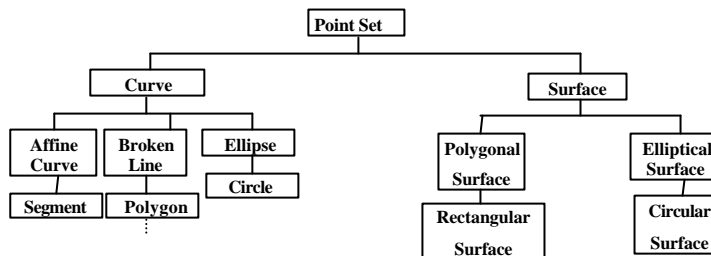
Red	Purple
Reddish Orange	Reddish Purple
Orange	Purplish Red
Orange Yellow	Purplish Pink
Yellow	Pink
Greenish Yellow	Yellowish Pink
Yellow Green	Brownish Pink
Yellowish Green	Brownish Orange
Green	Reddish Brown
Bluish Green	Brown
Greenish Blue	Yellowish Brown
Blue	Olive Brown
Purplish Blue	Olive
Violet	Olive Green

• Texture Concepts

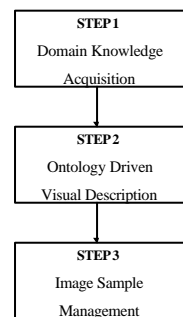
Created based on results coming from the cognitive science community



• Subset of geometric concepts



Knowledge Acquisition Tool



➔ Acquired knowledge is expressed in DAML+OIL
The JENA API is used for that purpose

Conclusion and Future Work

- We propose an ontology driven knowledge acquisition process for image description
- A dedicated tool has been developed
- We are currently working on machine learning techniques to extract and learn visual concepts
- An important work has to be done at the image processing level (Segmentation, Configuration)

