UNIVERSITY of GUELPH

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SCHOOL OF COMPUTER SCIENCE

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Natural Language Generation for Relative Position Description Using the Φ-Descriptor

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ABSTRACT:

Ordinary phrases like “the garden is surrounded by a fence" describe spatial relationships between objects. When scenes are captured in the form of digital images and machines expected to be able to communicate about space, models of spatial relationships must be designed. These models are often derived from an image descriptor called relative position descriptor. One of the most recent and promising descriptor is the Φ-descriptor.

In this thesis, we show that the models derived from the Φ-descriptor are sound and that the Φ-descriptor is semantically rich. We define and demonstrate a Φ-descriptor based fuzzy system that maps any pair of 2D image objects to an extensive, natural and sensible English-language description of the relative position of the objects. To our knowledge, there is no comparable, more expressive system. The system is tested on synthetic and real data, and suggestions on how to improve its descriptive capabilities are presented.