# UNIVERSITY of GUELPH

# COLLEGE *of* ENGINEERING AND PHYSICAL SCIENCES

## SCHOOL OF COMPUTER SCIENCE

# MSc Defence

## Monday June 3, 2019 at 10AM in Reynolds, Room 1101

Contributions to Relative Position Descriptor Computation in
the Case of Vector Objects

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**Chair:** Dr. Fangju Wang
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## Abstract:

Two new algorithms are introduced, both related to
Relative Position Descriptors (RPDs) in the case of vector objects.
The first, The Great Circle distribution, presents a new
spherical point distribution. This algorithm distributes points over the
surface of a sphere, ensuring points lie on the minimum number of
great circles possible, while keeping the points distributed evenly.
Multiple evenness measures are used to compare evenness with
multiple common spherical point distribution techniques.
This distribution is designed as a direction set for 3D RPDs,
where each point represents a direction, and will improve the
efficiency of 3D vector RPDs. The second new algorithm builds on
the φ-descriptor, a recent RPD. In this paper the first algorithm to
calculate the φ-descriptor for 2D vector objects is proposed and
tested. The results are compared against the existing
2D raster φ-descriptor. The new algorithm is intended to
show the versatility of the φ-descriptor.