

A COMPARATIVE ANALYSIS OF TEXTURE ANALYSIS METHODS ON ANT HEAD IMAGES

A Thesis Presented to
The Faculty of the Computer Science Department

by

Noah Gardner

In Partial Fulfillment
of Requirements for the Degree
Master of Science in Computer Science

Kennesaw State University

May 2022

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ABSTRACT

There is a large variety of ant species, and most species are diverse in terms of size, shape, behaviors, and especially skin (cuticle) textures. However, the significance of ant cuticle texture is not widely researched. This research employs modern machine learning methods such as texture analysis and classification with CNN and clustering to automatically group similar ant species to allow for the study of influences cuticle texture on ant ecology.

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Advisor: Dr. Chih-Cheng Hung

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To my family

Never fail to have this attitude of mind, go forward without hurry, learn the essence of things through frequent experiences, taking advantage of every occasion. Fight against all kinds of people and be aware of their mind. Follow a road that is a thousand leagues long one step at a time. Be without haste and be convinced that all these practices are the duty of a bushi. Be victorious today over what you were yesterday; tomorrow be victorious over your clumsiness and then also over your skill. Practice in accordance with what I have written without letting your mind deviate from the way.

Miyamoto Musashi ¹

¹Miyamoto Musashi, The Book of Five Rings

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CHAPTER 1: INTRODUCTION AND BACKGROUND

1 Introduction