# 1. Introduction

## 1.1 Purpose of the Carleton University Animal Care System (cuACS)

Animal shelters are tasked with the responsibility of providing care to animals in need while they await adoption into a loving home. Humans that are seeking the companionship of a pet can visit a shelter and choose an animal to adopt. However, with this process an issue often arises where a pet is adopted by a human with whom they are not fully compatible. This mismatch can be a result of a variety of reasons, including temperament, conflicting lifestyle requirements, and the physical and non-physical needs of both the pet and the potential adopter.

Carleton University Animal Care System (cuACS) aims to alleviate the issue of mismatching by providing a tool that automatically matches a pet to a potential owner based on compatibility. This compatibility measurement is based on matching the numerous physical and non-physical traits applicable to the animals in the shelter as well as the traits and desires of potential owners. cuACS enables a smooth adoption process, and ensures the experience will prove positive and match an animal which both fulfills a clients expectations and suits their lifestyle and needs.

cuACS provides support for cats, dogs, rabbits and lizards. The system takes into account over 20 physical and non-physical traits of the animal, as well as client traits in order to provide an optimal match. An algorithm is utilized to determine which animal and which client are the most suited for each other.

## 1.2 Document Overview

This document aims to address the transformation of the analysis model into a system design model. This includes the primary activity of designing the subsystem decomposition. Subsystem decomposition is where the system is decomposed into smaller parts based on the use case and analysis model. Subsystems are replaceable parts of the system that encapsulate the state and behavior of the classes contained within defined interfaces.

This document includes the implementation decomposition of the second deliverable (D2). It will describe each logical subsystem implemented with our D2 features, and include class diagrams and packages. This document will also detail the decomposition of the full system. A description of each subsystem within the entire cuACS system will be provided.

Design evolution is also explored to present the differences between the decomposition for the D2 feature implementation and the decomposition for the entire cuACS system. Design choices will be discussed in detail, including the reasoning of their implementation.

Persistent storage will be described in detail, including the strategy for storing and the reasoning behind the organization of the data. Each object in persistent storage will be detailed.

Finally, an explanation of design patterns will be provided. Design patterns are the partial solutions to common problems. The goal was to choose design patters that consisted of a small number of classes to provide a robust and modifiable solution. In this section, a description of the Gang of Four patters will be explored, and reasons for methods chosen (or not chosen) will be justified.