cuACS ACM Algorithm

Team JSB

Traits - Physical

The following traits are used by our Animal-Client Matching Algorithm in order to help generate quality long-lasting matches;

1. Type of Animal - (Dog, Cat, Bird, Small Pet)
2. Sex - (M, F)
3. Size - (Small, Medium, Large)
4. Colour - (Brown, Black, Golden, Orange, White, Grey, Multi)
5. Age - (Any positive integer)
6. Lifespan - (Any positive integer)

Traits - Non-Physical

The following traits were selected by relevancy to client's typical wants and needs from their future pets;

1. Difficulty of Care
2. Affection Needed
3. Cost of Care
4. Time Commitment
5. Space Needed
6. Loudness
7. Activeness
8. Integration with Children
9. Integration with Dogs
10. Integration with Cats
11. Obedience Level
12. Shedding

ACM - Weights

As each trait varies in importance to the client, we used a weight system in order to allow the algorithm to generate matches for traits based on how important they are to the overall quality of the match.

This weight system assigns a value between 1 and 5 to show traits that are less important and traits that are more important, respectively.

The Need For Cases

Analyzing the trait selections, we realized the need to have separate matching equations based on what kind of trait the ACM was analyzing.

Through extended analysis, we broke our traits down into 3 main cases for the algorithm to utilize in computing the match quality.

In the following case equations, “Animal” refers to the animal’s trait value and “Client” refers to the client’s trait value.

Case 1 - “Hit or Miss”

Case 1 represents fixed value traits which are good when the Animal’s trait matches with the Client’s selection.

Traits included are Type of Animal, Size, and Sex.

Equation = if (Animal==Client && Animal != 0) {
return 1 * Weight
}else if (Animal != 0){
return -1 * {Weight}
} else{
return 0;
}

Range Outputted = (-5, 5)

Case 2 - “Client Extremes”

Case 2 represents traits for which the client’s trait should be higher or very close to the animal’s trait. In the event that the animal’s trait is more than 3 higher than the client’s, the match would be considered quite poor.

Traits included = (Difficulty of Care, Cost of Care, Affection Needed, Time Commitment, Space Needed)

Equation = ((Client-Animal)/Client)*Weight

Range Outputted = (-20, 5)

Case 3 - “Middle”

Case 3 represents traits for which the animal and client values should be as close together as possible.

Traits Included = (Lifespan, Activeness, Obedience Level, Shedding, Age, Loudness)

Equation = Weight/(ABS(Animal-Client)+1)

Range Outputted = (0.5, 5)