IFish Farm

ALI AHMED – HUSSAM ELDIN – OMAR ANAS – YOUSSEF MOHAMED

SUPERVISOR: DR. AYMAN EZZAT, DR. AYMAN NABIL

TEACHER ASSISTANT: ENG. NOHA ELMASRY

DATE: 08/03/2020

Introduction

In 2017, Egypt was considered as one of the top ten aquaculture producers in the world by producing 1.5 million tonnes of fish.

Different tasks in fish farms:

- Water quality monitoring. (Ammonia level detection)
- Anomalies insides pond (Speed, Patterns ..etc)

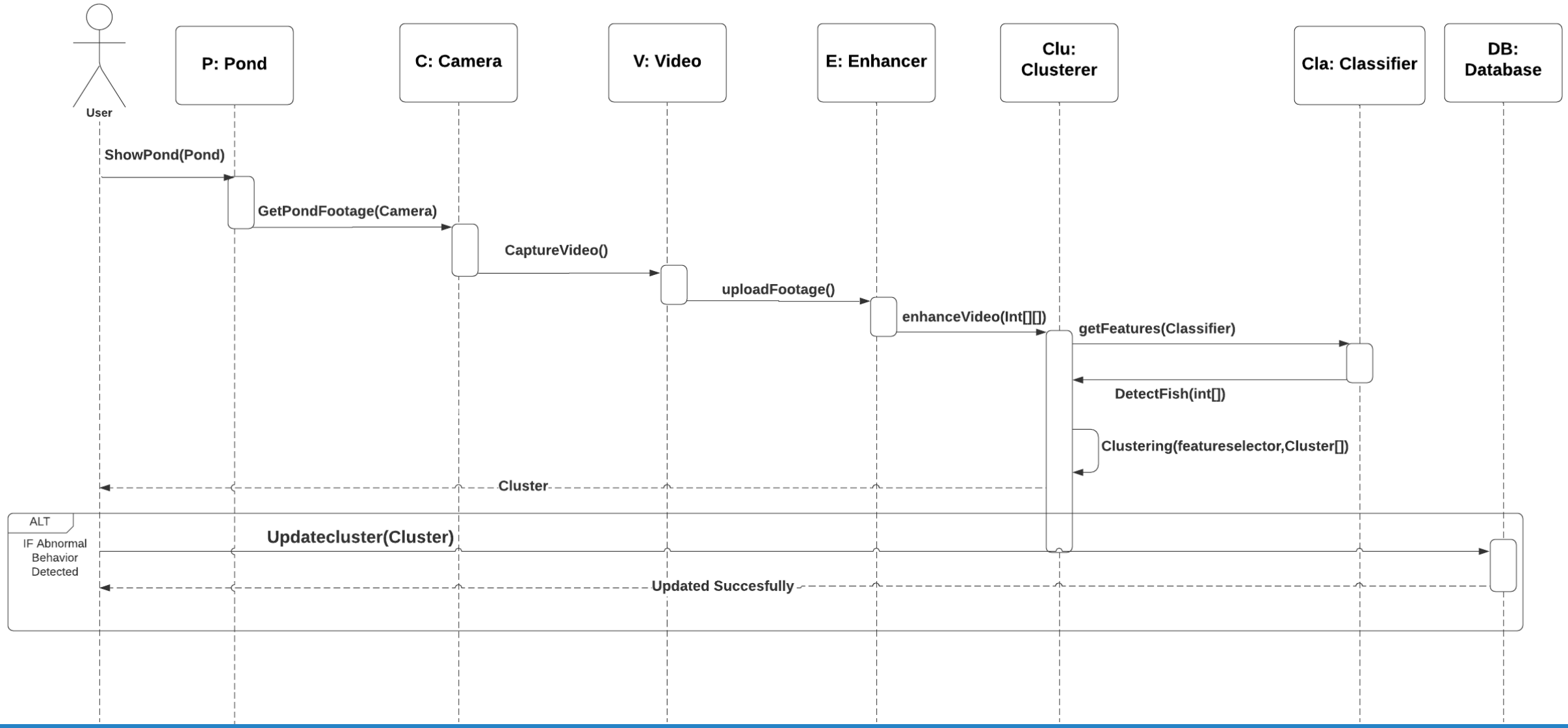
- UN Sustainable Development Goals

Producer	Finfish		Crustaceans	Molluscs	Other species	National total
	Inland aquaculture	Mariculture				
	(Tonnes)			(Tonnes)		
China	23 341 134	1 028 399	3 592 588	12 343 169	803 016	41 108 306
India	3 812 420	84 164	299 926	12 905	...	4 209 415
Viet Nam	2 091 200	51 000	513 100	400 000	30 200	3 085 500
Indonesia	2 097 407	582 077	387 698	...	477	3 067 660
Bangladesh	1 525 672	63 220	137 174	...	...	1 726 066
Norway	85	1 319 033	...	2 001	...	1 321 119
Thailand	380 986	19 994	623 660	205 192	4 045	1 233 877
Chile	59 527	758 587	...	253 307	...	1 071 421
Egypt	1 016 629	...	1 109	...	...	1 017 738
Myanmar	822 589	1 868	58 981	...	1 731	885 169

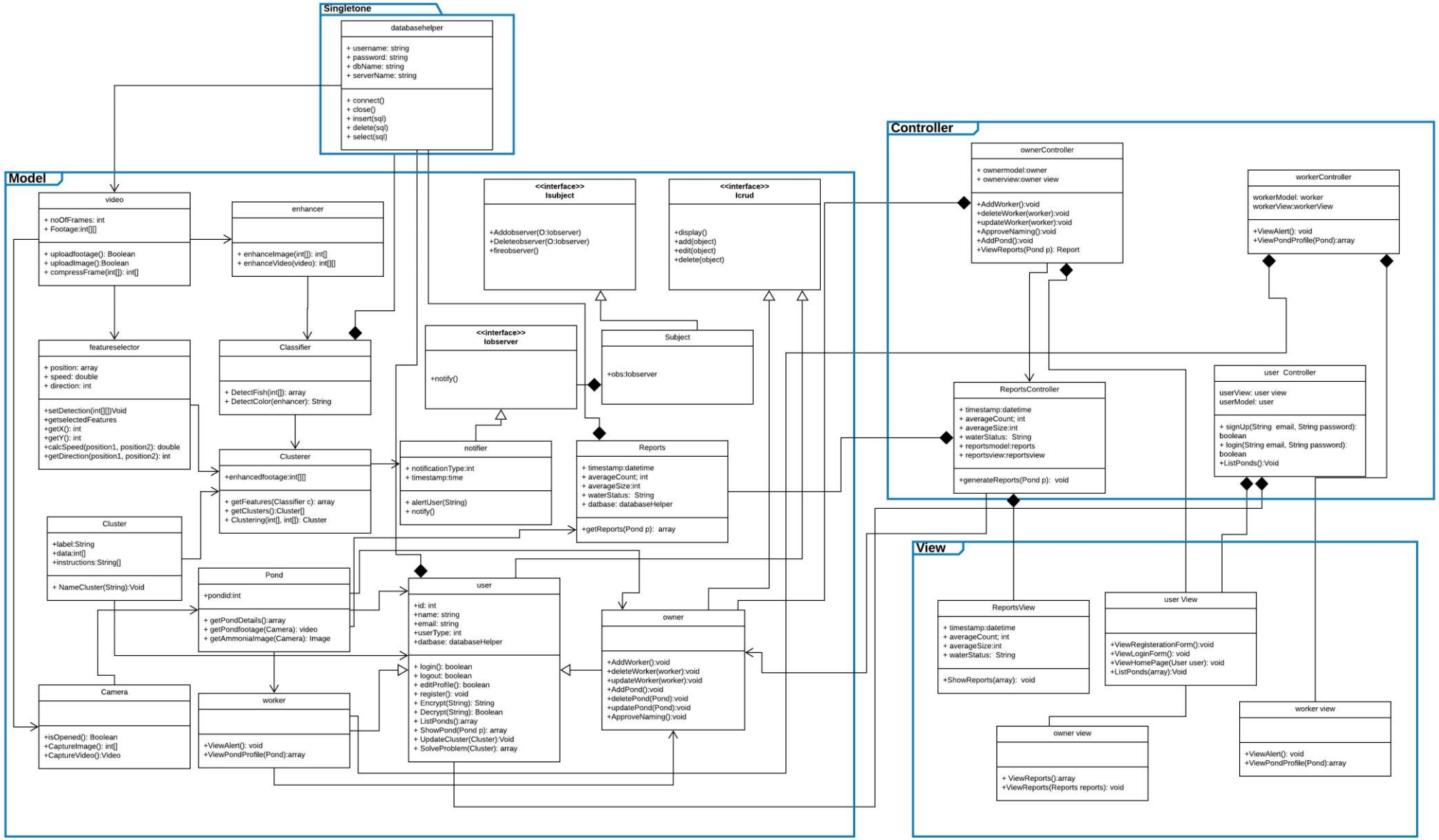
Problem Statement

Enhancing the classification accuracy of fish behavior under difficult water conditions by improving the water visual through image processing techniques, and providing real-time feedback on water quality through web application.

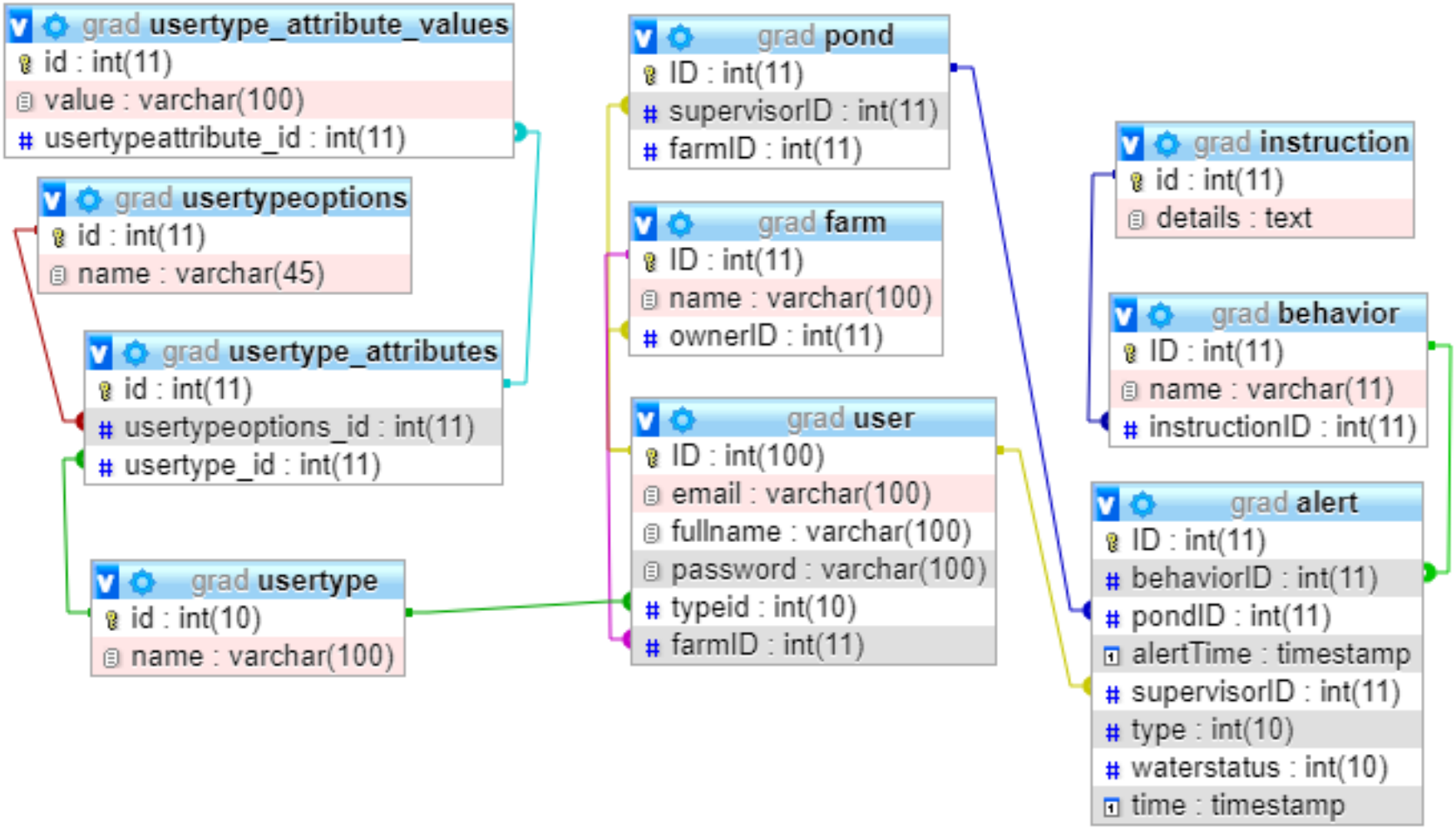
Clustering Sequence Diagram



Class Diagram



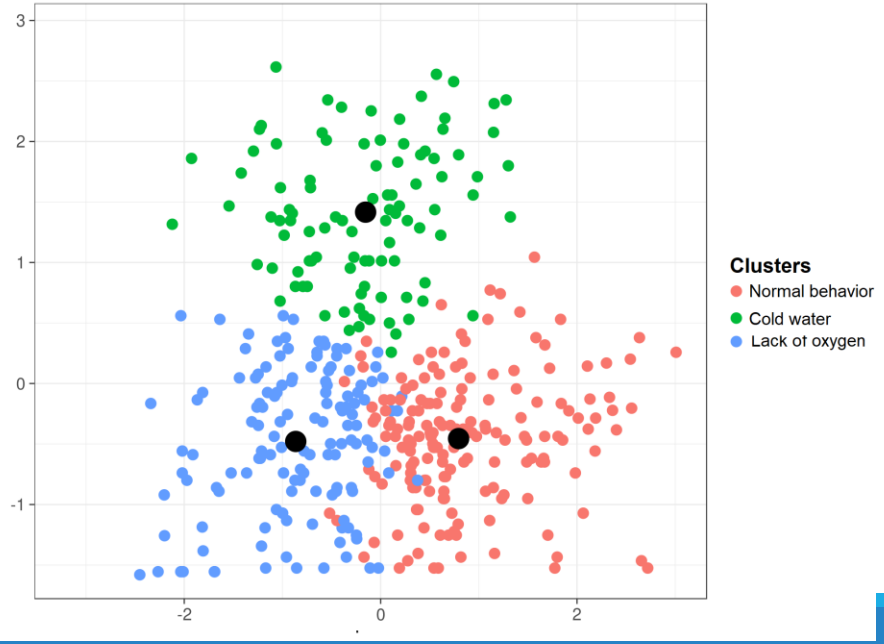
Database Design



Methodology

- Get data from YOLO
- Calculated extra features from collected data
- Form feature array and normalize it
- Use Kmedoids to cluster it and detect the pond behavior

	Fish						Fish						Fish					
	x	Y	Z	speed	Direction	Range of spread	x	Y	Z	speed	Direction	Range of spread	x	Y	Z	speed	Direction	Range of spread
Frame 1																		
Frame 2																		
Frame 3																		
Frame 4																		



Clustering Algorithm Used 1/2

K-medoids Algorithm:

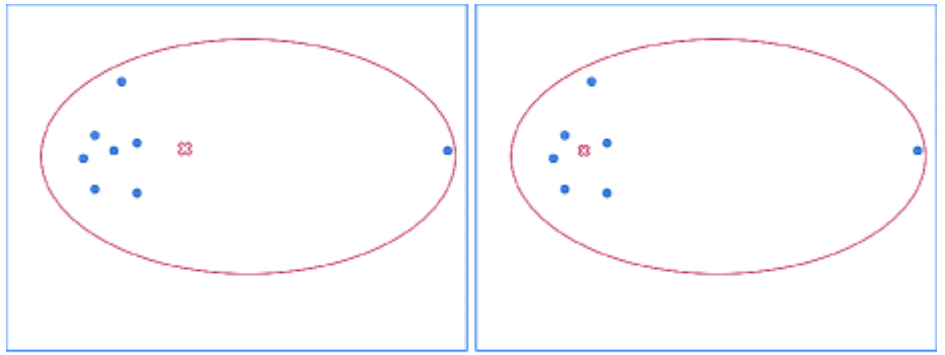
- It partitions the dataset into groups and chooses data points as medoids (centers) for each cluster as its most centrally located point with the least dissimilarity to other objects in the cluster.

Clustering Algorithm Used 2/2

Why K-medoids?

Compared to K-means, it is more flexible and robust when it comes to noise and outliers because it minimizes the absolute distance between the points and the selected centroid, as opposed to minimizing the square distance in k-means.

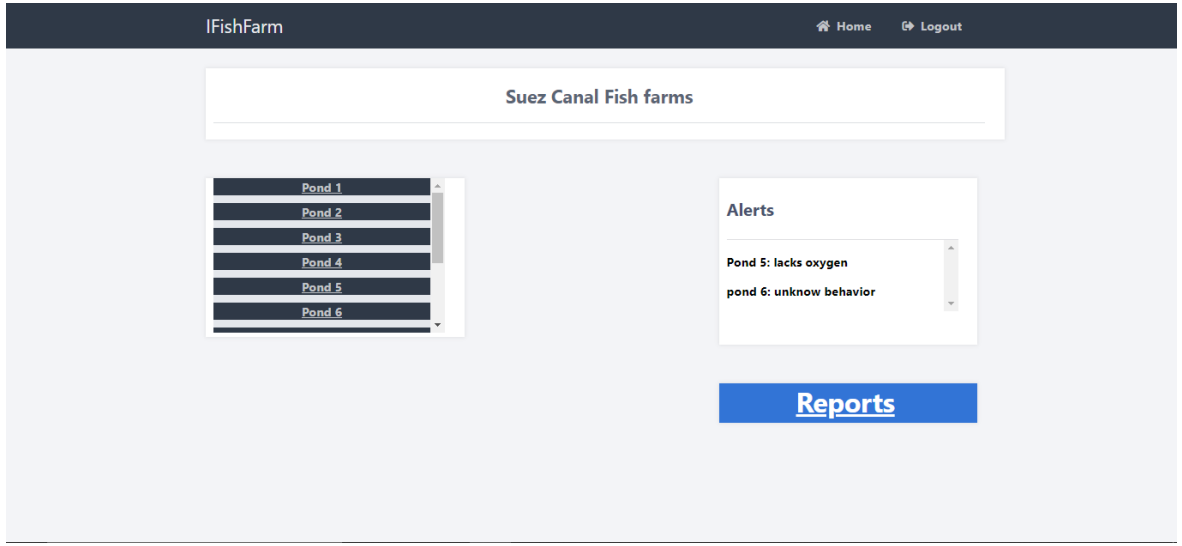
A medoid has to belong to the set (cluster), while a centroid doesn’t.

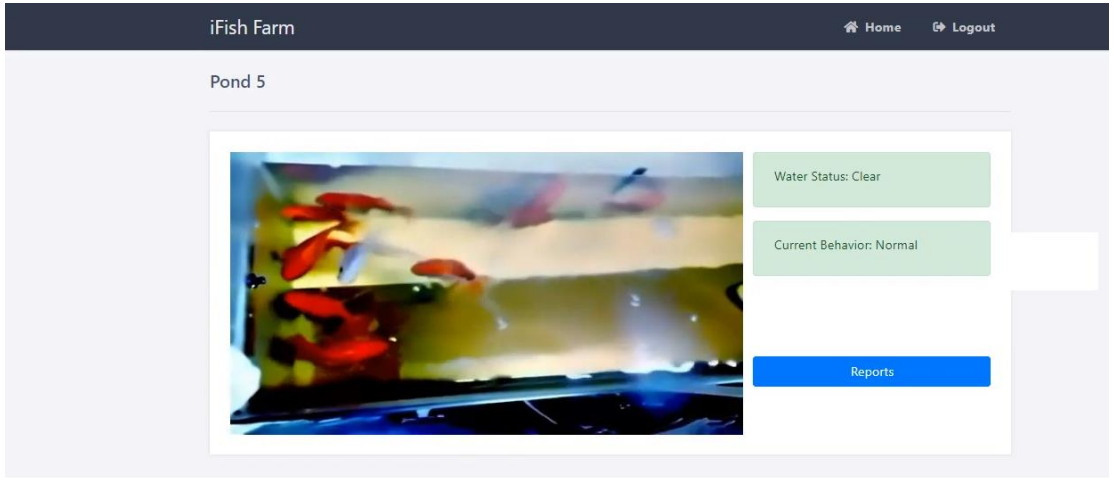


(a) Mean (b) Medoid

This makes K-medoids a suitable clustering algorithm to accurately cluster the behaviours in our system.

User Interface





Published Paper

The paper was paid and will be published in Elsevier ANT 2020 conference

Acadia University Event Services
15 University Avenue
Wolfville
Nova Scotia, CA
B4P 2R6
ross.chapman@acadiau.ca

ORDER CONFIRMATION

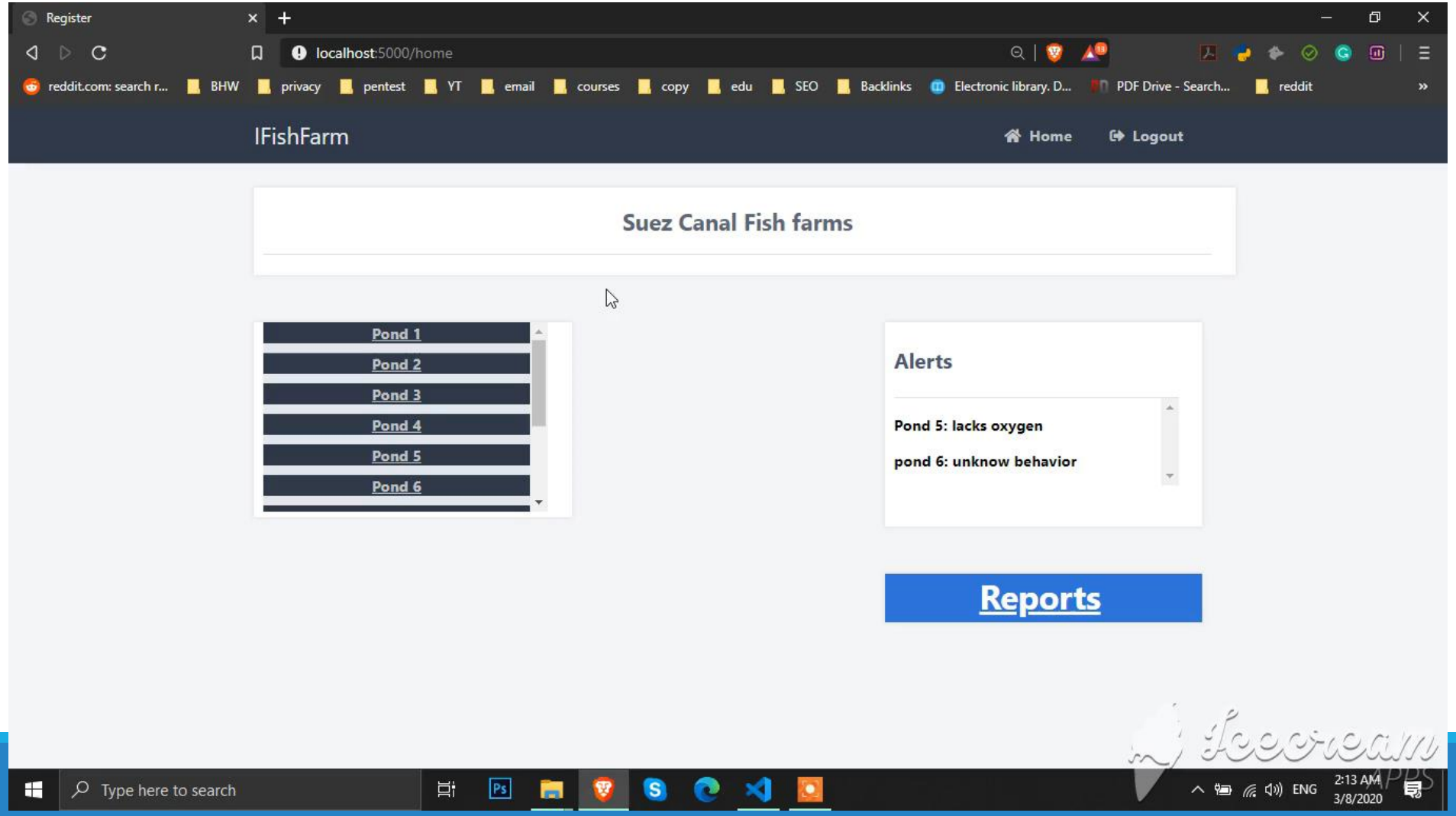
Date: February 1, 2020
Transaction ID: 8342
Status: Complete

Event Name: ANT / EDI40 / Workshops 2020 Registration
(view)

Ticket	Description	Quantity	Price	Total
Author: Student and Non-Student (€550)	(For ANT / EDI40 / Workshops 2020 Registration) *This ticket can be used once at any of the dates/times below.*	1	$820.00	$820.00

Demo1/2

Demo2/2


Register
localhost:5000/home
reddit.com: search r...
BHW
privacy
pentest
YT
email
courses
copy
edu
SEO
Backlinks
Electronic library. D...
PDF Drive - Search...
reddit
IFishFarm
Home
Logout
Suez Canal Fish farms
Pond 1
Pond 2
Pond 3
Pond 4
Pond 5
Pond 6
Alerts
Pond 5: lacks oxygen
pond 6: unknow behavior
Reports
Type here to search
ENG
2:13 AM
3/8/2020

Any Questions?

Thank You