AUTOMATION OF COCO-SUGAR PRODUCTION

January 15, 2016 – February 15, 2017

Beneficiary: Ragay Coconut Industry Development Council (RCIDC) Coco-House, F. Simeon, Ragay, Camarines Sur

IMPACT OF THE PROJECT TO THE END-USERS

- ✓ Increased production and quality control of the coconut sugar
- ✓ Open business opportunity and livelihood to the coconut farmers
- ✓ Ragay Coconut Industry Development Council (RCIDC) will be known for having the first automated coco sugar production system
- ✓ Developed partnership of the local farmers, LGU, Academe and Industry

PHOTOS OF MANUAL ACTIVITIES

PHOTOS OF ACTIVITIES CONDUCTED

(SITE VISIT AND OFFICIAL GROUND BREAKING)

PHOTOS OF ACTIVITIES COMPLETED

PHOTOS OF ACTIVITIES COMPLETED

PHOTOS OF ACTIVITIES COMPLETED

USAID
FROM THE AMERICAN PEOPLE

RTI INTERNATIONAL

FINAL PROJECT OUTPUT

Philippine Coconut Authority

THE UNIVERSITY OF ARIZONA

USAID
FROM THE AMERICAN PEOPLE

RTI INTERNATIONAL

THANK YOU!

Philippine Coconut Authority

THE UNIVERSITY OF ARIZONA

Vision-Based Artificial Intelligence Analytics Software for Traffic and Transport Application

Contactless Apprehension of Traffic Violators on 24-Hour Basis All-Vehicle Detection System (CATCH-ALL)

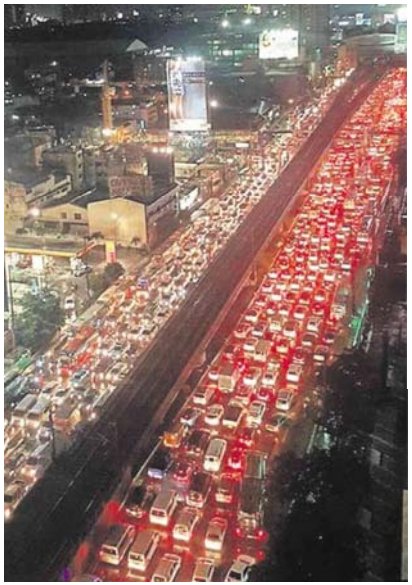
DLSU - Intelligent Systems Laboratory

Start Up Project Funded by:
Department of Science and Technology - Philippine Council for Industry, Energy, and Emerging Technologies for Research and Development (DOST-PCIEERD)

Major Cause of Traffic Congestions in Metro Manila

Volume-Based Traffic Congestion

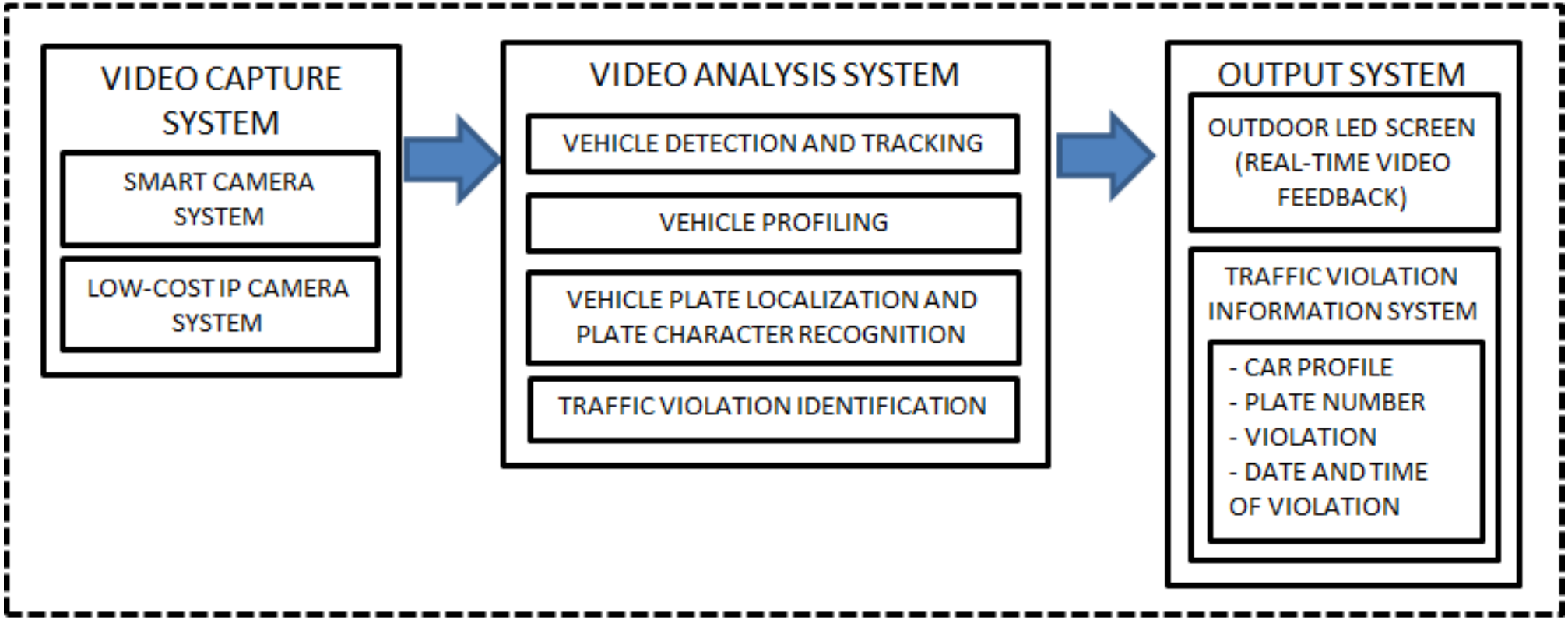
Behavior-Based Traffic Congestion



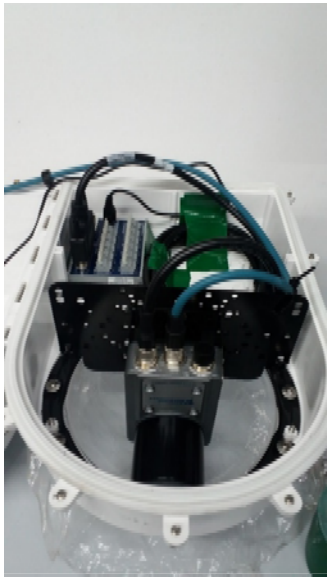
CATCH-ALL System

- **CATCH-ALL** is a **vision-based system** that incorporates **artificial intelligence** algorithms used for **vehicle detection, tracking, and identification**, as well as, **traffic violations detection**. It has 3 main sub-systems: video capture, video analytics, and output sub-systems.
  - The **video capture system** is a network of roadside cameras connected to a remote server location.
  - The **video analytics system** is consists of vehicle detection and tracking, license plate localization and recognition, and traffic violations detection algorithms.
  - The **output system** contains the **traffic violations database** and **outdoor LED screen notification system**.

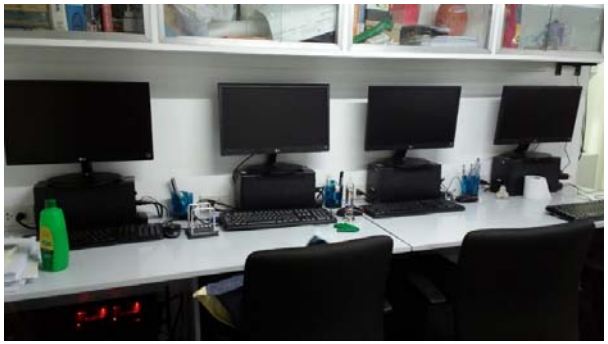
System Architecture

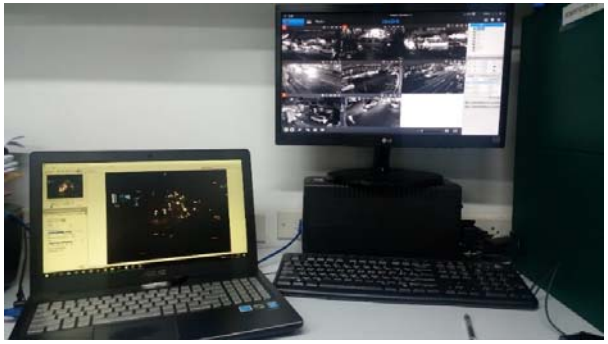


Cameras, Computers, and Server



Cameras





Computers

Server

Video Capture System

"Catch-All" cameras keep watch on Taft Avenue for traffic violations.—MARIANNE BERMUDEZ

LS-1

LS-2

LS-3

Taft-1

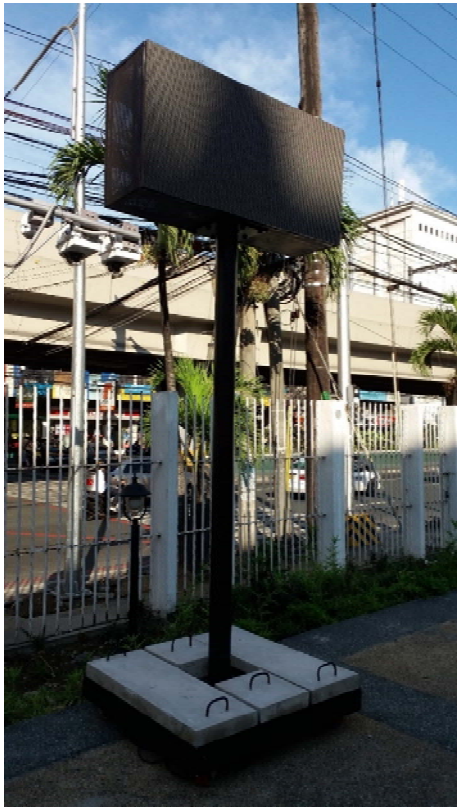
Taft-2

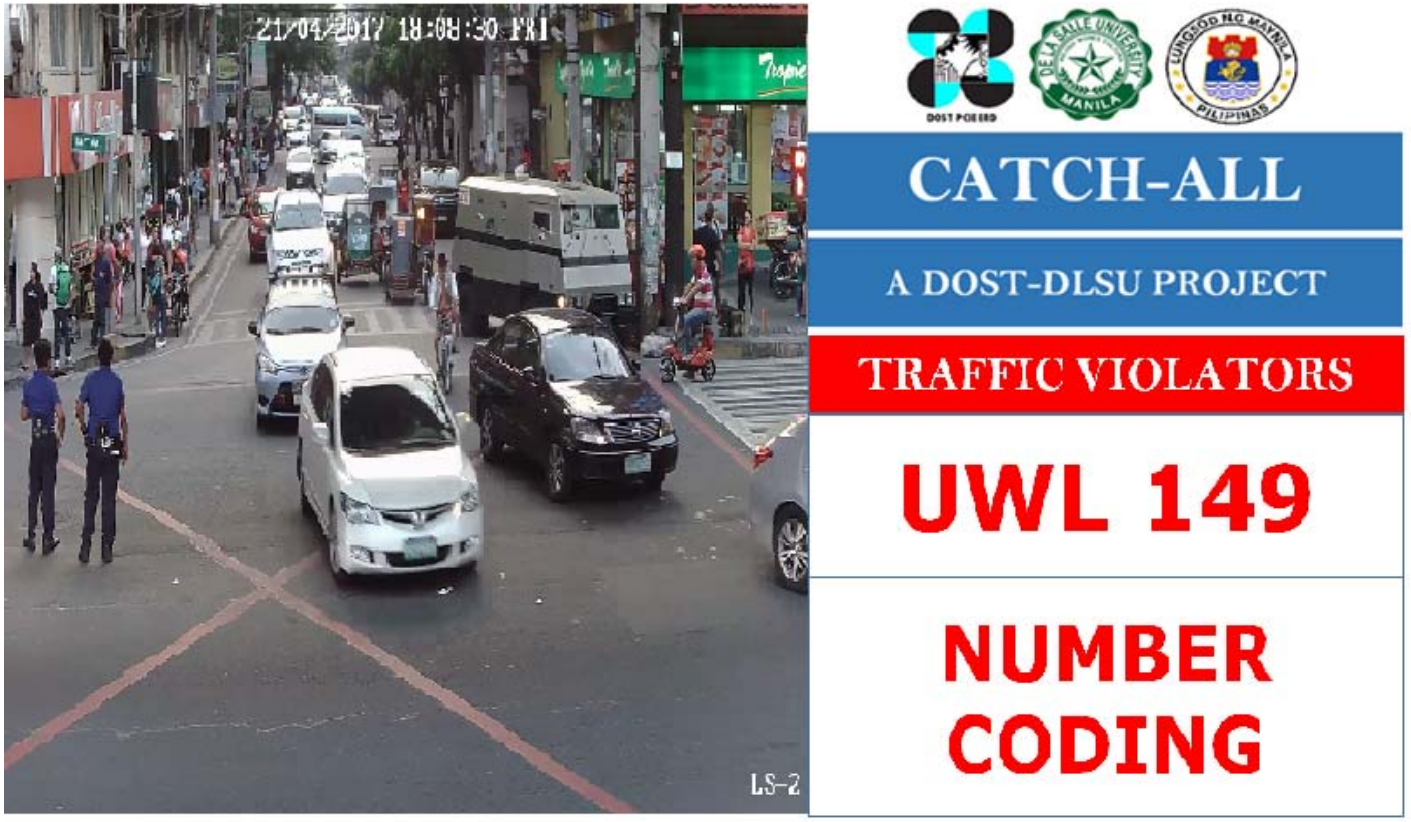
Taft-3

Estrada-1

Estrada-2

Outdoor LED Screen Notification System





Screen Preview

Product and Services

Products and Services

CATCH-ALL system is an integration of vision and machine learning systems that offers better performance in visual monitoring, recording, and evidence gathering tasks.

Software as a Service (SaaS): It includes customizable features such as,

- **Vehicle detection and counting system**
- **Vehicle classification system**
- **License plate detection and optical character recognition system**
- **Number coding detection system**
- **User interface application**
- **Reports generation tool** (incidence, summary and tracking reports)

Product and Services

SaaS and Data as a Service (DaaS):

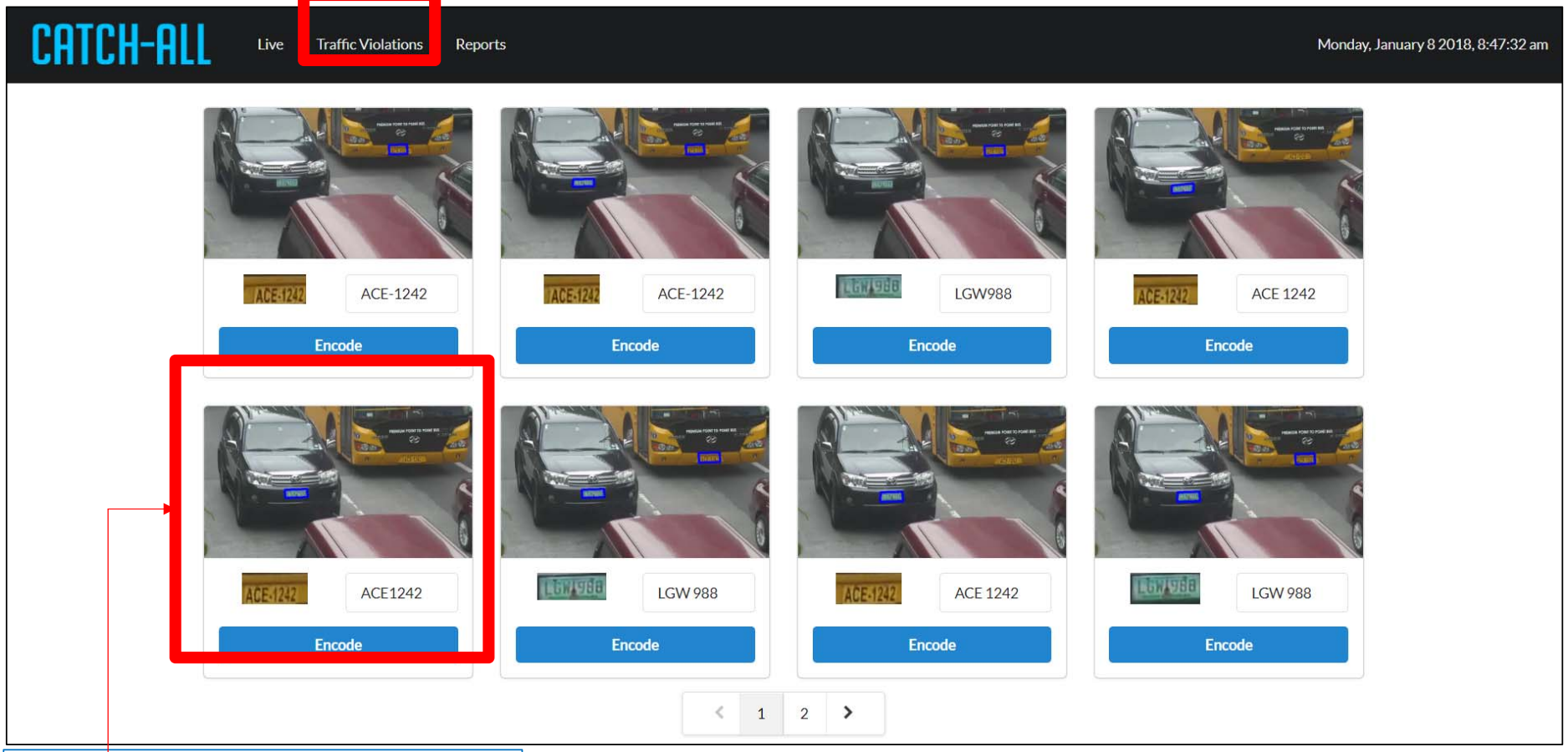
- Raw video storage
- Automated database encoding
- Video evidence storage and retrieval

Outsource Reports Generation:

- **Incidence reports** (vehicle and plate image, time stamp, location, violation)
- **Summary reports** (daily, weekly, monthly)
- **Tracking reports**
  - Validated
  - Sent
  - Settlement (contested, accepted and pay)

The Product

Traffic Violations Page



Shows detected cars and license plate captured in the camera vicinity.

The Product

Shows image of detected car.

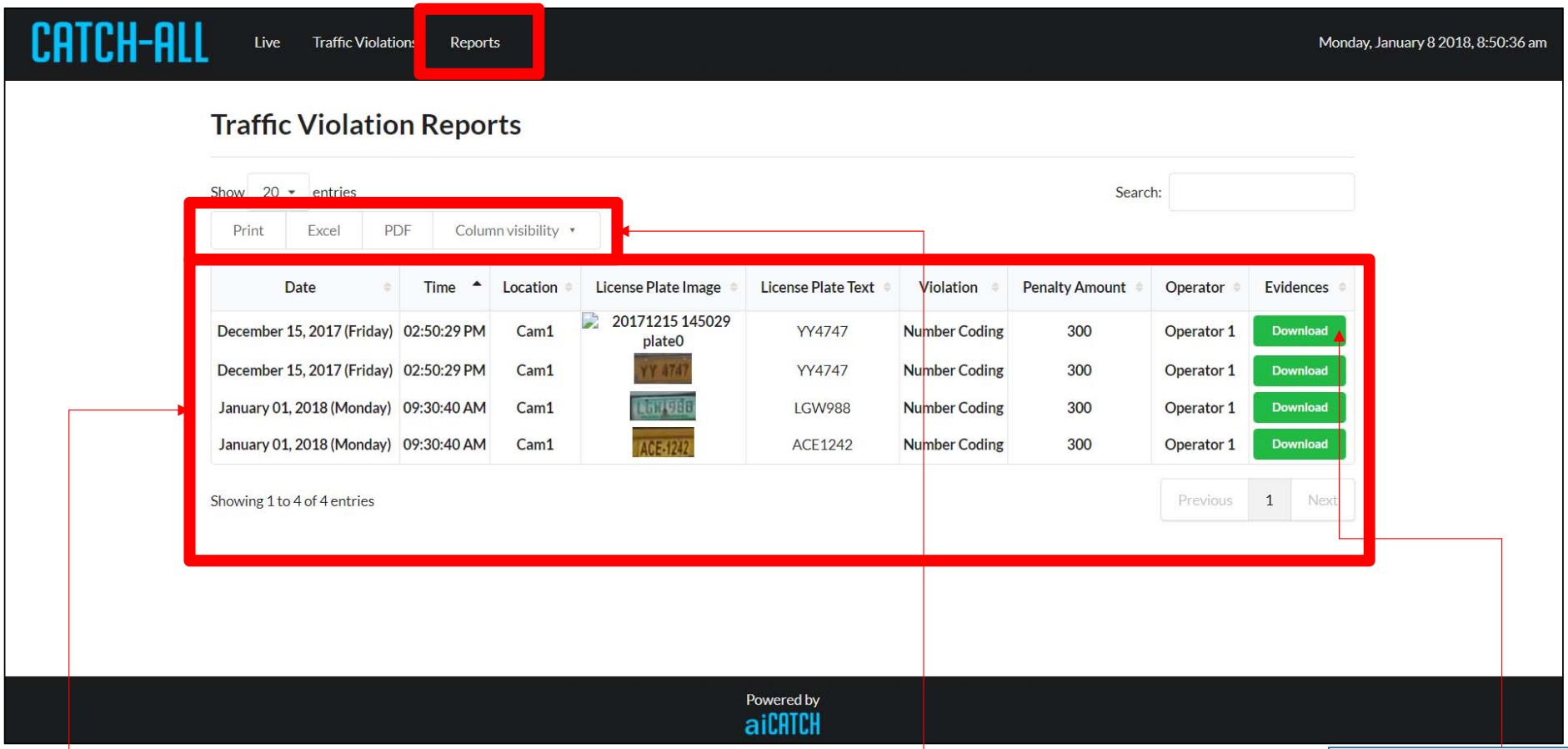
Suggestive text box shows possible reading of license plate.

Shows image of detected license plate.

Operator simply clicks encode button to submit traffic violator to database.

The Product

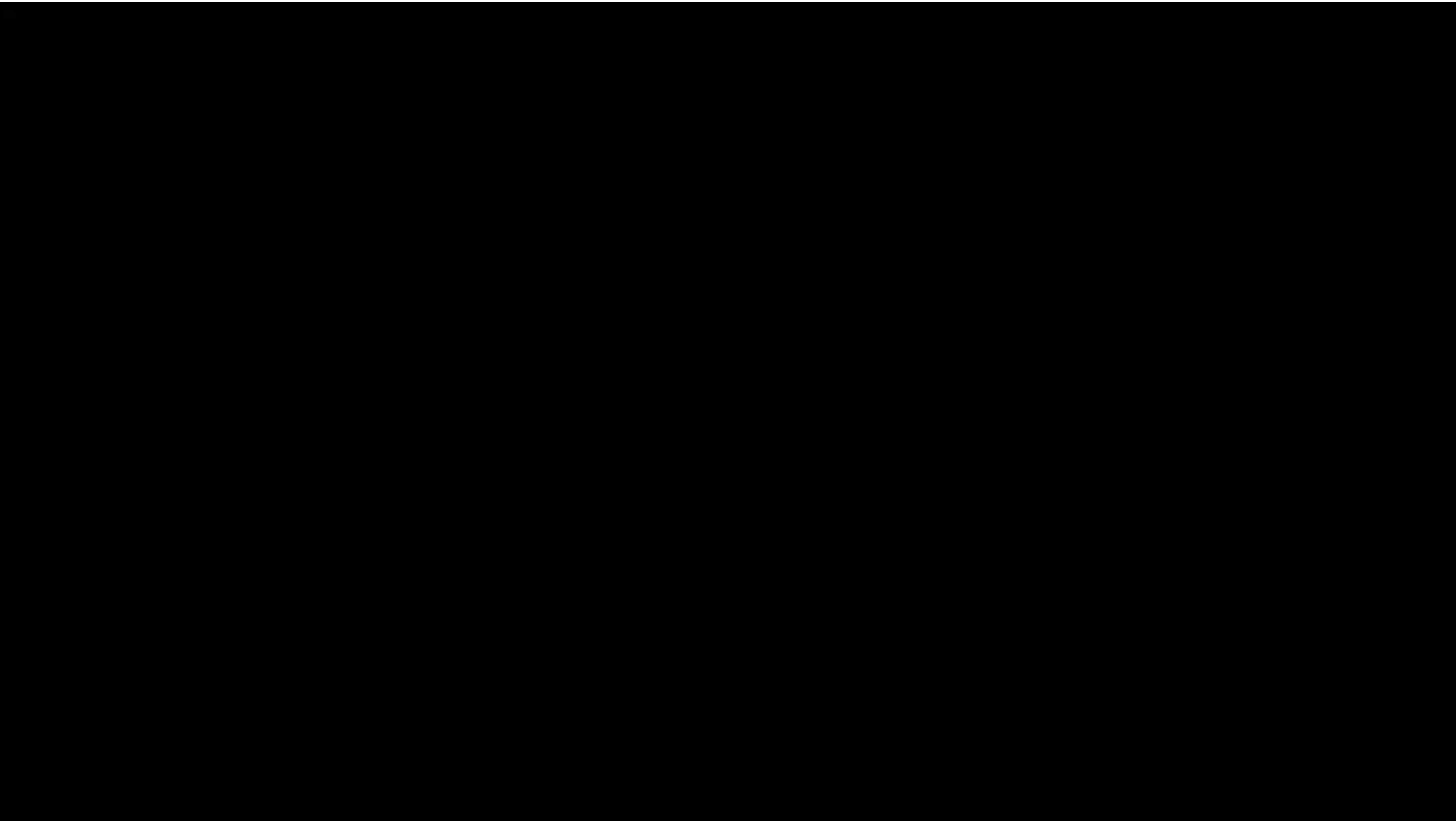
Reports Page



Shows the list of capture violators.

Operator have the option to print the list or download file in Excel or PDF.

Operator can download the evidence associated with the traffic violation.



Credits and Contacts

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4rth APPC
Aerial Swarm Robotics

Dr. Elmer P. Dadios

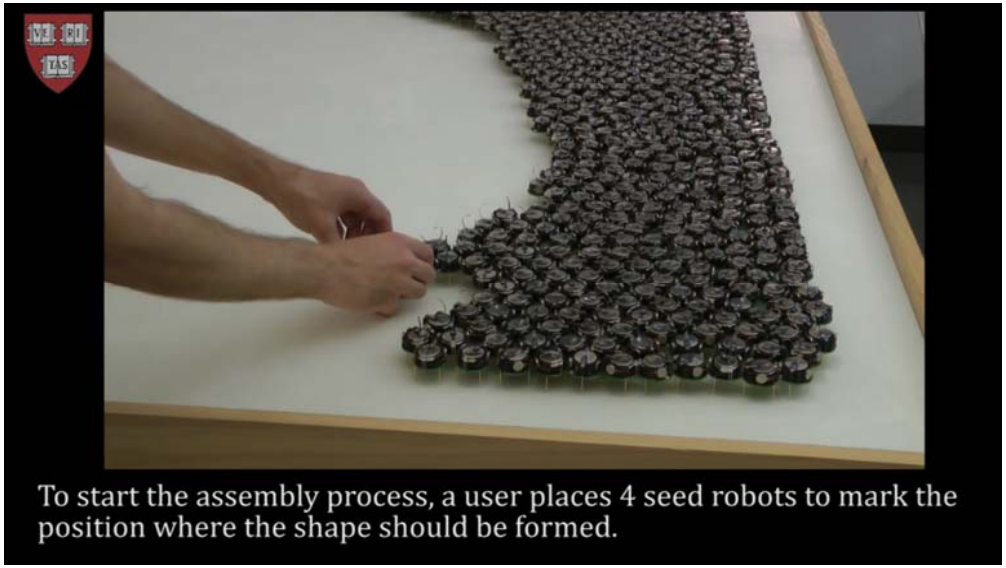
Full Professor 10 and University Fellow

De La Salle University, Philippines

The Start of Swarm Robotics

Swarm Intelligence And Robotics

Swarm intelligence refers to the set of algorithms



Physical demonstration of swarm behavior application of swarm principles to robots is called swarm robotics

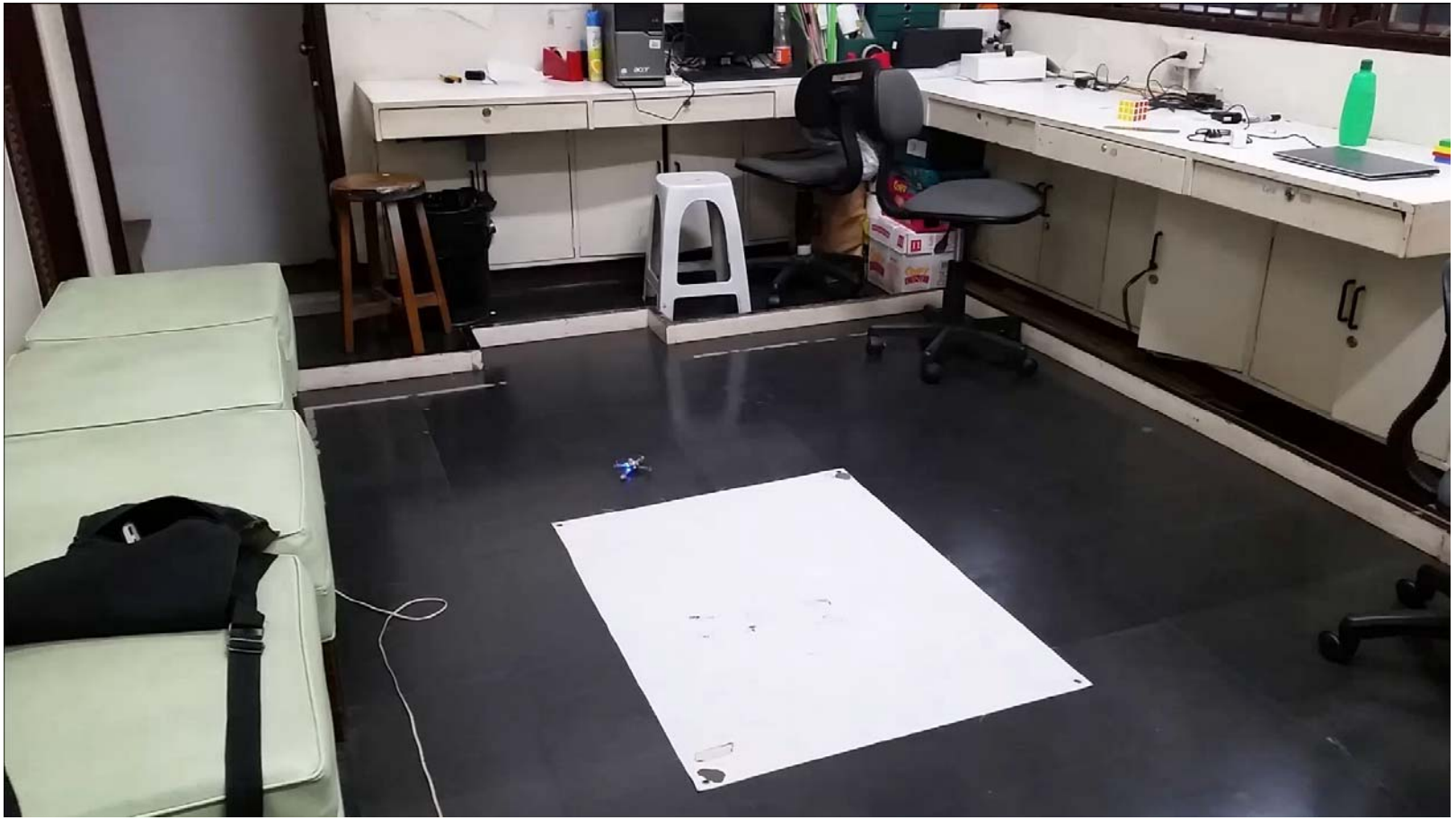
The Solution

- **Swarming**
  - **Collective behavior of social animals**
    - **Protection from predators**
    - **Searching of food**
    - **Reproduction**
    - **Migration**
  - **Swarm covers more grounds, accomplish more tasks.**
  - **Swarm amplifies the ability of a single member of the swarm**

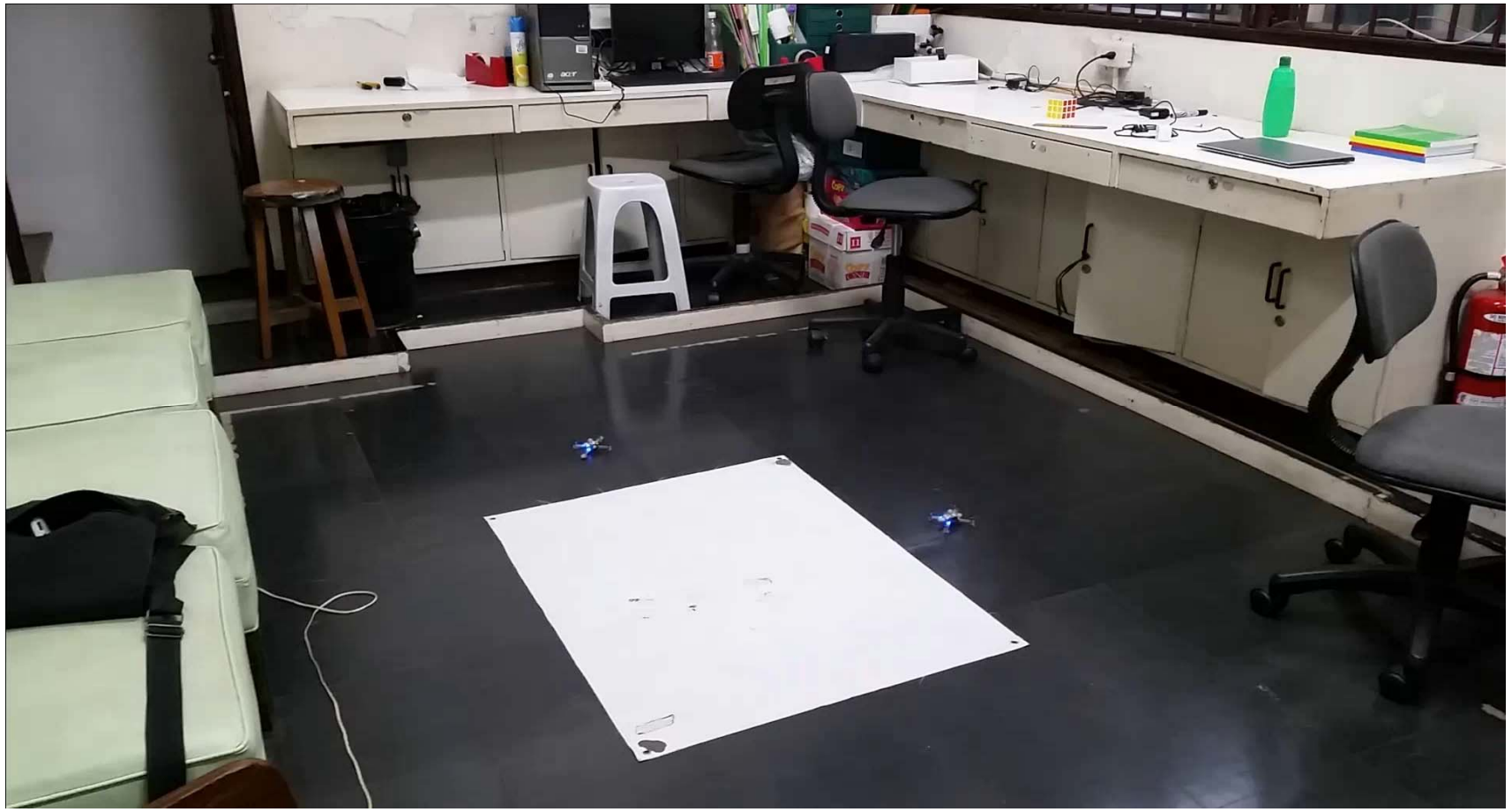
Possible Applications

- Swarm of drones can be used in times of disaster for relief and rescue operations.
- Swarm of drones can be used for photography, film and vision related applications
- Swarm of drones can be used for crops and environment applications.

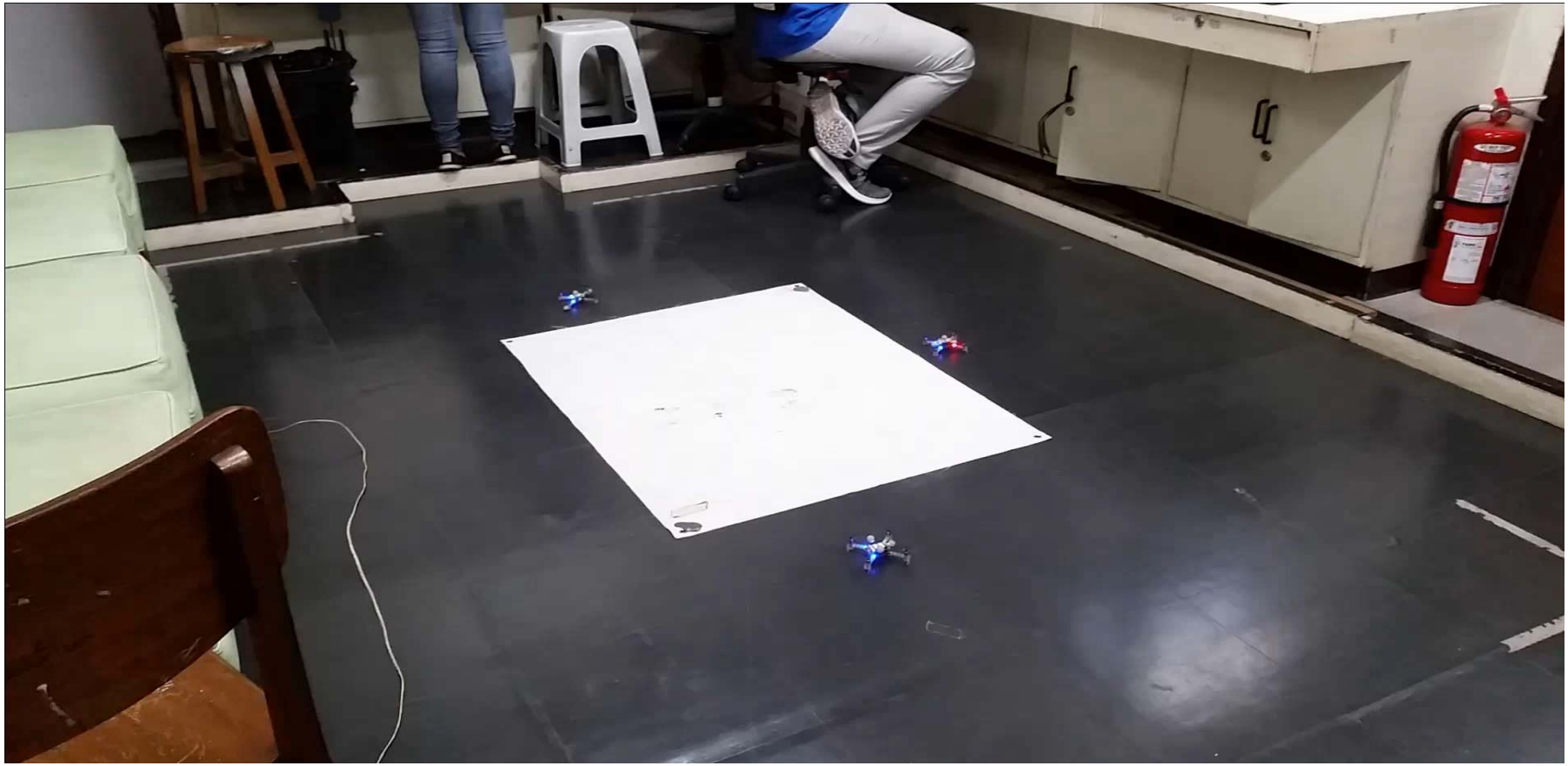
Implementations – Single Drone



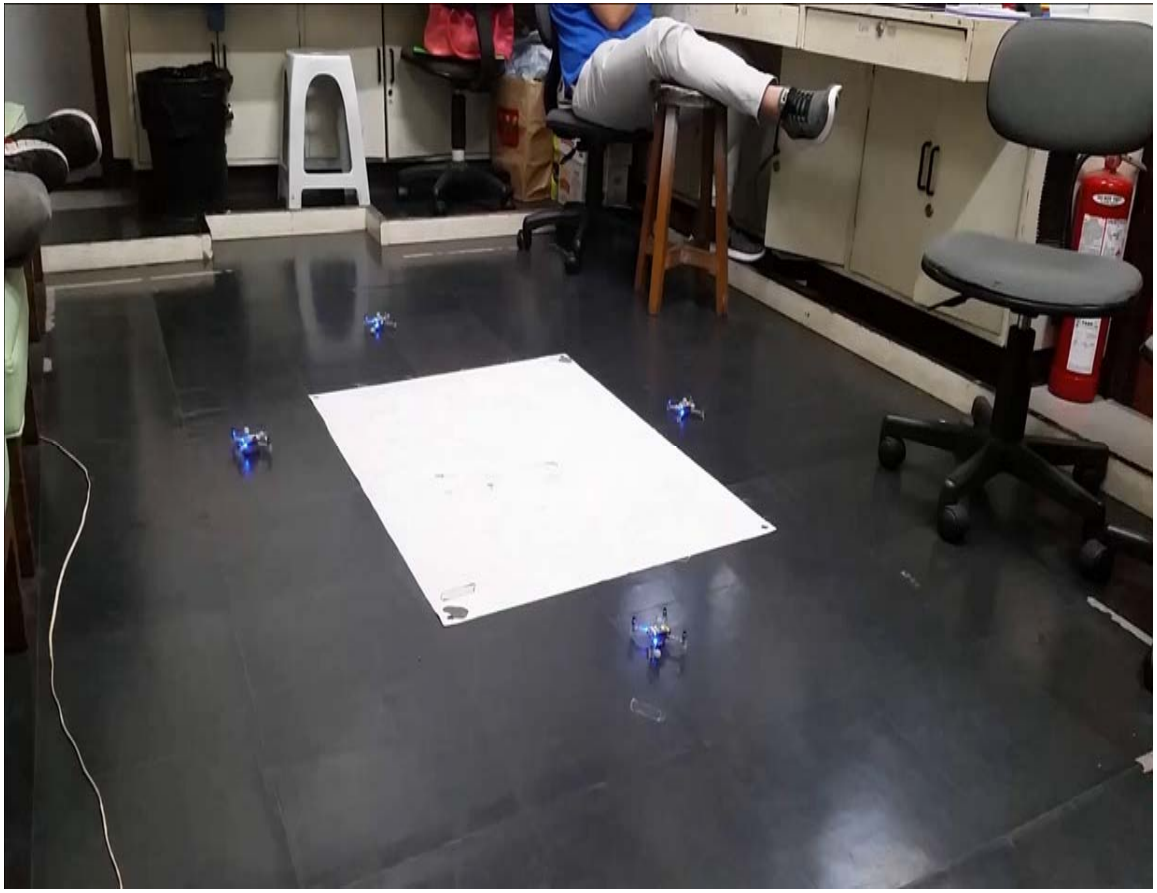
Implementations – Two Drones



Implementations – Three Drones



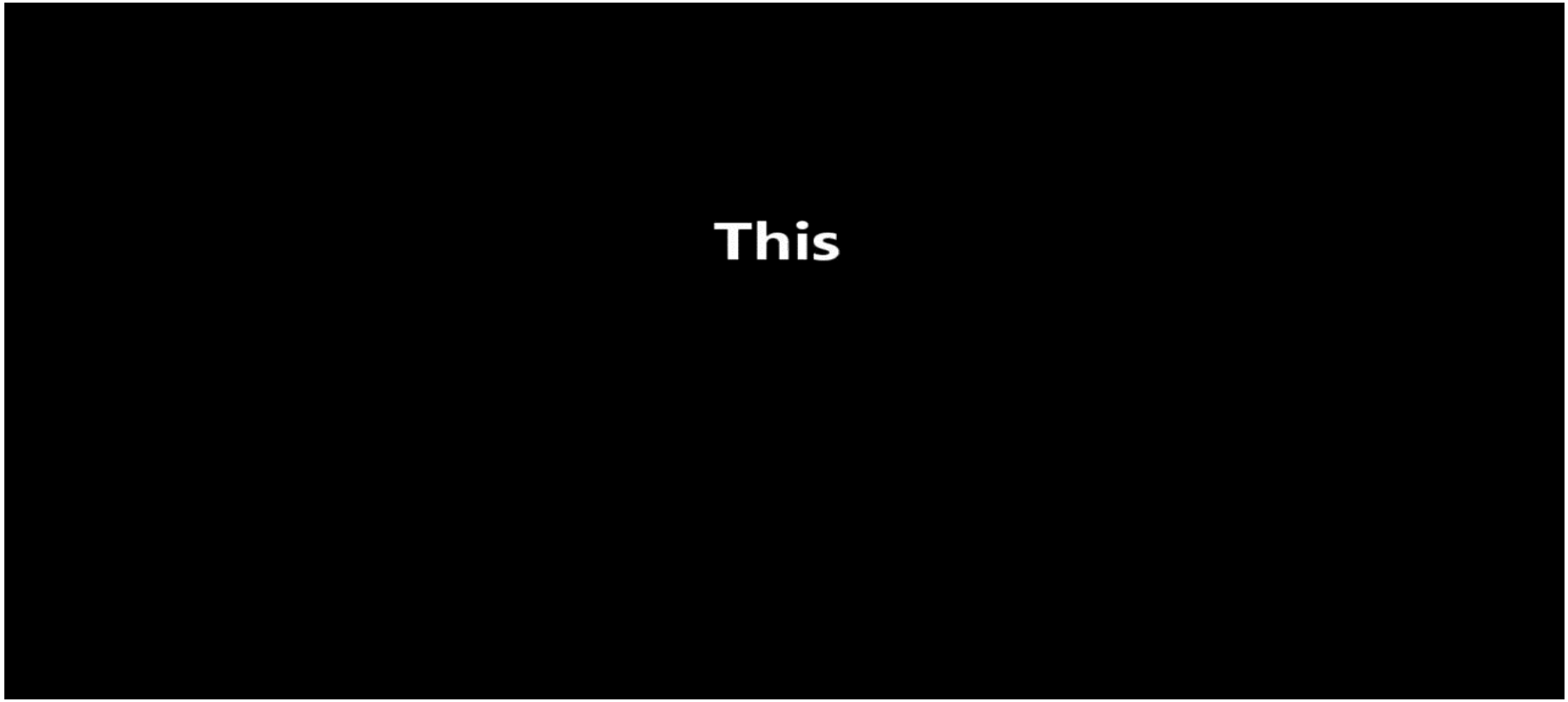
Implementations – Four Drones



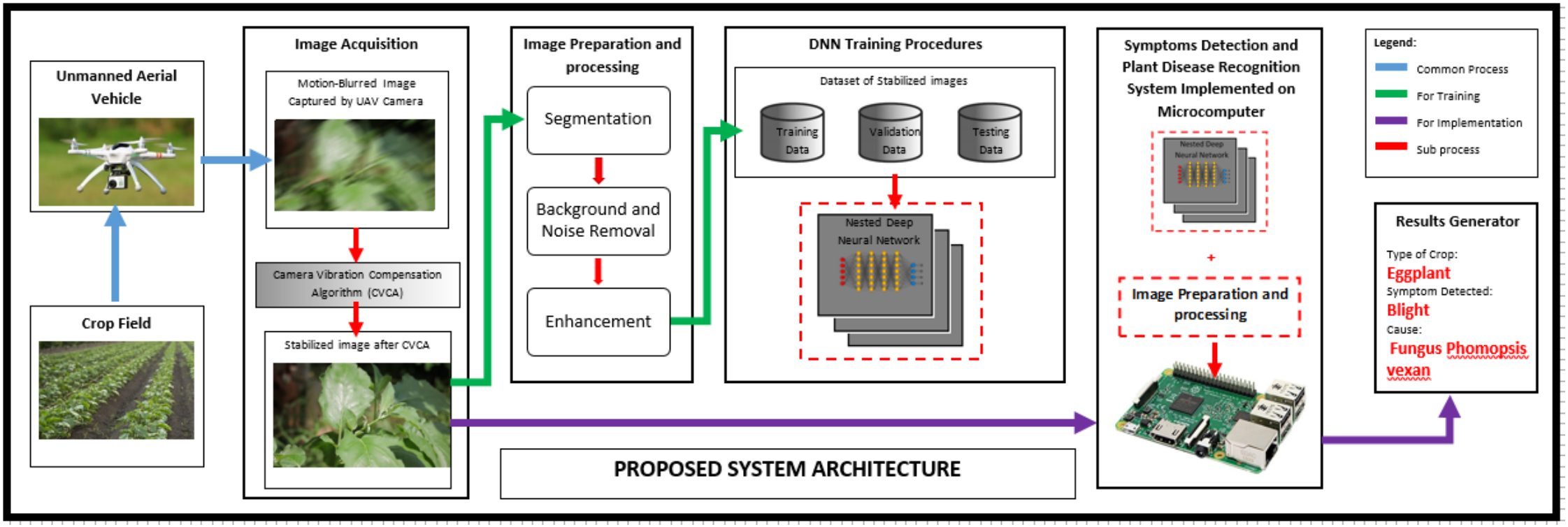
Implementations – Four Drones (Repel)

Additional Results – Load Transport

Additional Results – Game of Drones



Symptoms detection and plant disease recognition system for multi-rotor UAVs


Unmanned Aerial Vehicle
Crop Field
Image Acquisition
Motion-Blurred Image Captured by UAV Camera
Camera Vibration Compensation Algorithm (CVCA)
Stabilized image after CVCA
Image Preparation and processing
Segmentation
Background and Noise Removal
Enhancement
DNN Training Procedures
Dataset of Stabilized images
Training Data
Validation Data
Testing Data
Nested Deep Neural Network
Symptoms Detection and Plant Disease Recognition System Implemented on Microcomputer
Nested Deep Neural Network
+
Image Preparation and processing
Legend:
Common Process
For Training
For Implementation
Sub process
Results Generator
Type of Crop:
Eggplant
Symptom Detected:
Blight
Cause:
Fungus Phomopsis vexan
PROPOSED SYSTEM ARCHITECTURE

My Researchers

Aerial Swarm Robotics

Dr. Elmer P. Dadios

Full Professor 10 and University Fellow

De La Salle University, Philippines