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DEPARTMENT OF COMPUTER STUDIES

TITLE DEFENSE REVISIONS AND COMPLIANCE FORM

Student Name:	**Bides, Matthew Isaac L.**
	Caliwan, Neil Yvan S.
	Fernandez, Alexander James Ian J.
	Macaranas, Kurt Baron S.
Approved Title:	**Apula: CNN-Powered Fire Detection And Alert System Using**
	CCTV Footage, Thermal Imaging, And Temperature Sensors
Defense Date:	**June 13, 2025**

REVISIONS
The panelists suggested that we create a process box and a schematic diagram, both signed and approved by a licensed professional electrical engineer. They also recommended that our Artificial Intelligence model be also trained on datasets capable of distinguishing between different types of smoke.   Signature for: Matthew Bides   Click to sign   Signature for Matthew Bides   Click to sign

Approved by:

STEPHEN BACOLOR
Panel Member

NESTOR MIGUEL PIMENTEL
Panel Member

ELY ROSE L. PANGANIBAN-BRIONES, MIT
Defense Chairperson

```
                              START

          Thermal Input / CCTV                    Sensor Inputs
                Footage

          Convolutional Neural              COLLECTS DATA WITH
          Network (CNN) ANALYSIS                Raspberry Pi

              RAW DATA                            RAW DATA

                         Analyze Data
                     (Artificial Intelligence)

       YES                                   NO
                         Is fire detected?

  Maximum Severity       Analyze Fire Severity           GO BACK TO THE
                       (Artificial Intelligence)             START

              SEND MOBILE              Minumun severity
              NOTIFICATION

                    YES          Call         NO
                              Responders?

              SEND MOBILE
              NOTIFICATION

                              END
```

Component Legend

- Input Devices
- Processing Unit
- Storage
- Network
- Output/Alert

IP Camera — CCTV Footage (12V)

MLX90640 — Thermal Imaging

ESP32 — Temperature Sensor (3.3V)

Arduino — MQ-2 Gas/Smoke

Raspberry Pi 4 — Main Controller, CNN Processing, YOLO v5 Model, PyTorch Framework

Database — Data Storage

WiFi Router — Network

SMS Gateway — Text Alerts

Mobile App — Live Feed, Alerts, Controls

Fire Dept — Emergency

Video Feed · Thermal Data · Temp Data · Gas/Smoke · Store Data · Network · SMS · Alerts