REAL-TIME MANUFACTURING PROCESS MONITORING SYSTEM

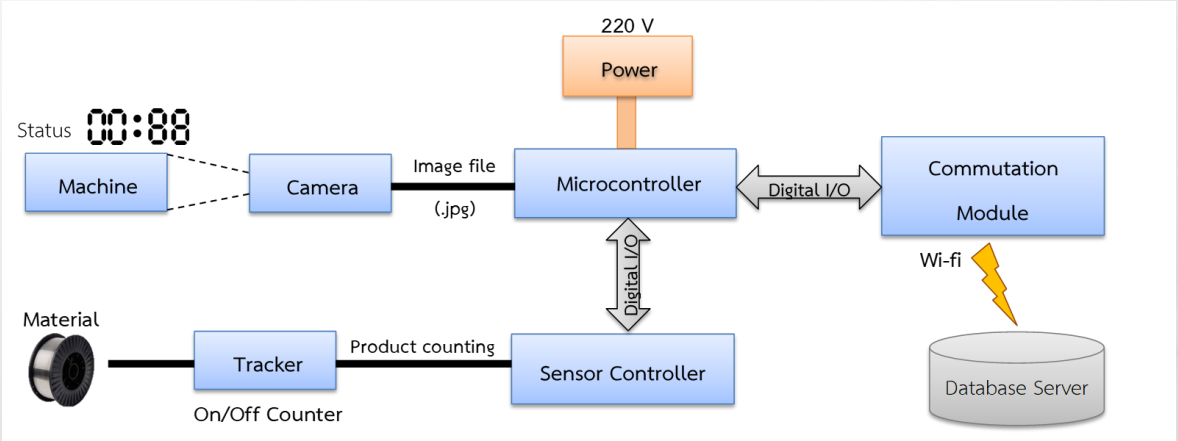
UTTAPOL SMUTKUPT,
JUGGAPONG NATWICHAI AND PASKORN CHAMPRASERT

PROBLEMS

- OLD FASHION MANUFACTURING SYSTEM
- READINESS OF MACHINES AND RELATED PROCESSES
- MIS-PLANNED RAW MATERIALS
- EXCESSIVE FAILED INSPECTION
- POOR-ESTIMATION IN INVENTORY INCLUDING RAW MATERIALS OR REQUIRED PARTS AS WELL AS STOCK MANAGEMENT

PROPOSED SYSTEM

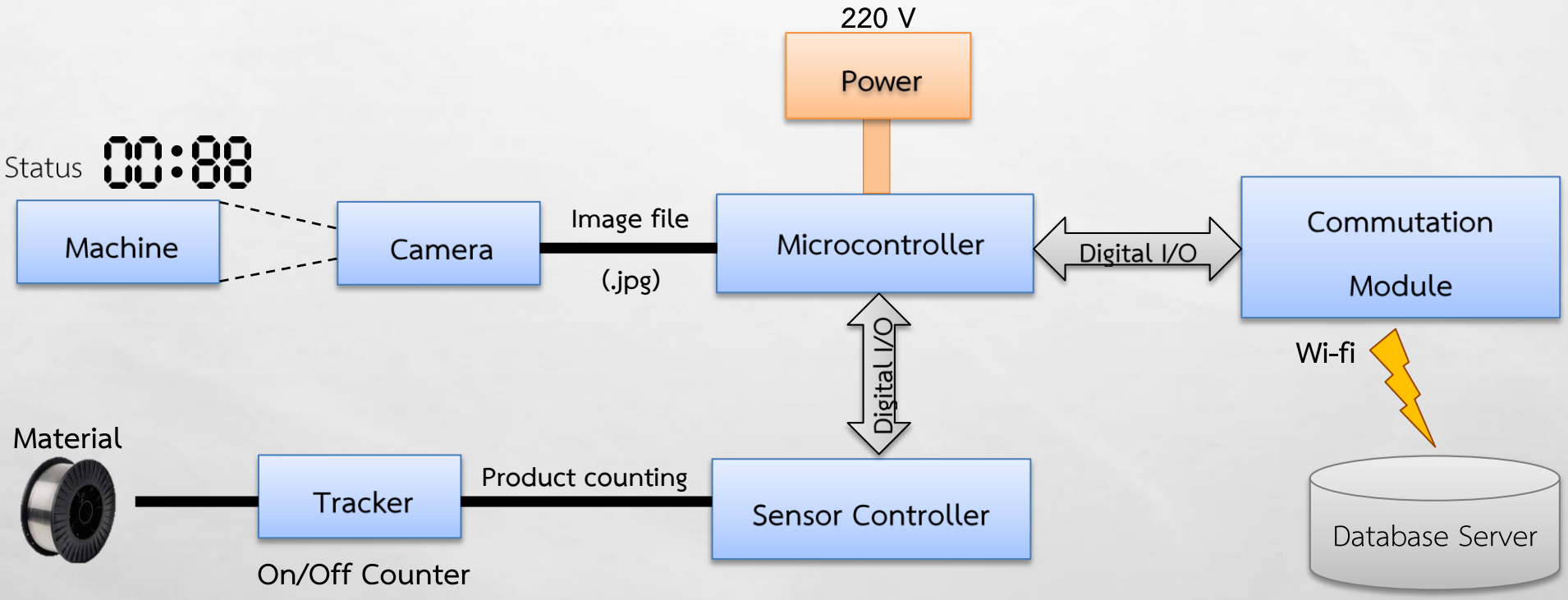
- ORIGINAL MACHINE
- AUTOMATIC DATA RETRIEVAL
- DATABASE
- MONITORING SYSTEM
- DASHBOARD



IOT

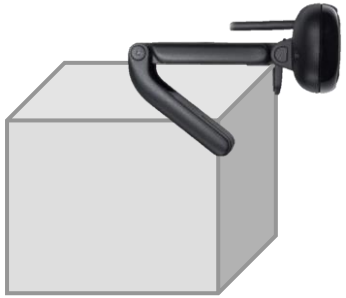
- ALLOWS AN DEVICE TO COMMUNICATE TO ANOTHER DEVICE VIA THE INTERNET
- REALIZES THE SEAMLESS INTEGRATION OF VARIOUS MANUFACTURING DEVICES EQUIPPED WITH SENSING, IDENTIFICATION, PROCESSING, COMMUNICATION, ACTUATION, AND NETWORKING CAPABILITIES
- OPENS THE DOOR TO CREATE WHOLE NEW BUSINESS AND MARKET OPPORTUNITIES FOR MANUFACTURING.
- MAKES REAL INDUSTRIAL APPLICATIONS AND SMART MANUFACTURING

REAL-TIME MONITORING SYSTEM



CASE STUDY

Webcam



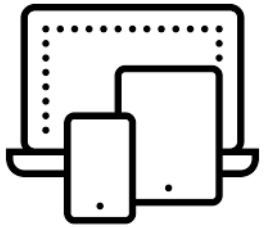
Model

WiFi Communication

Router

Internet

Web & Database Sever



Personal Devices

DESIGN MODEL

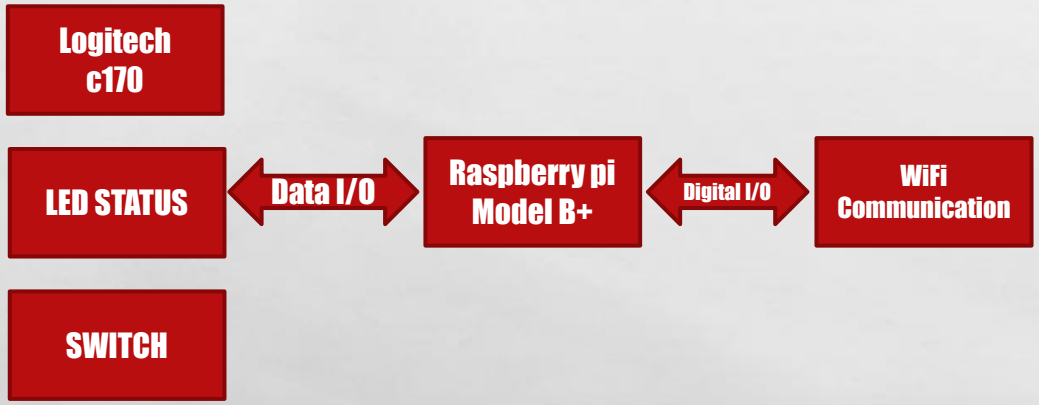
- HARDWARE
- SOFTWARE

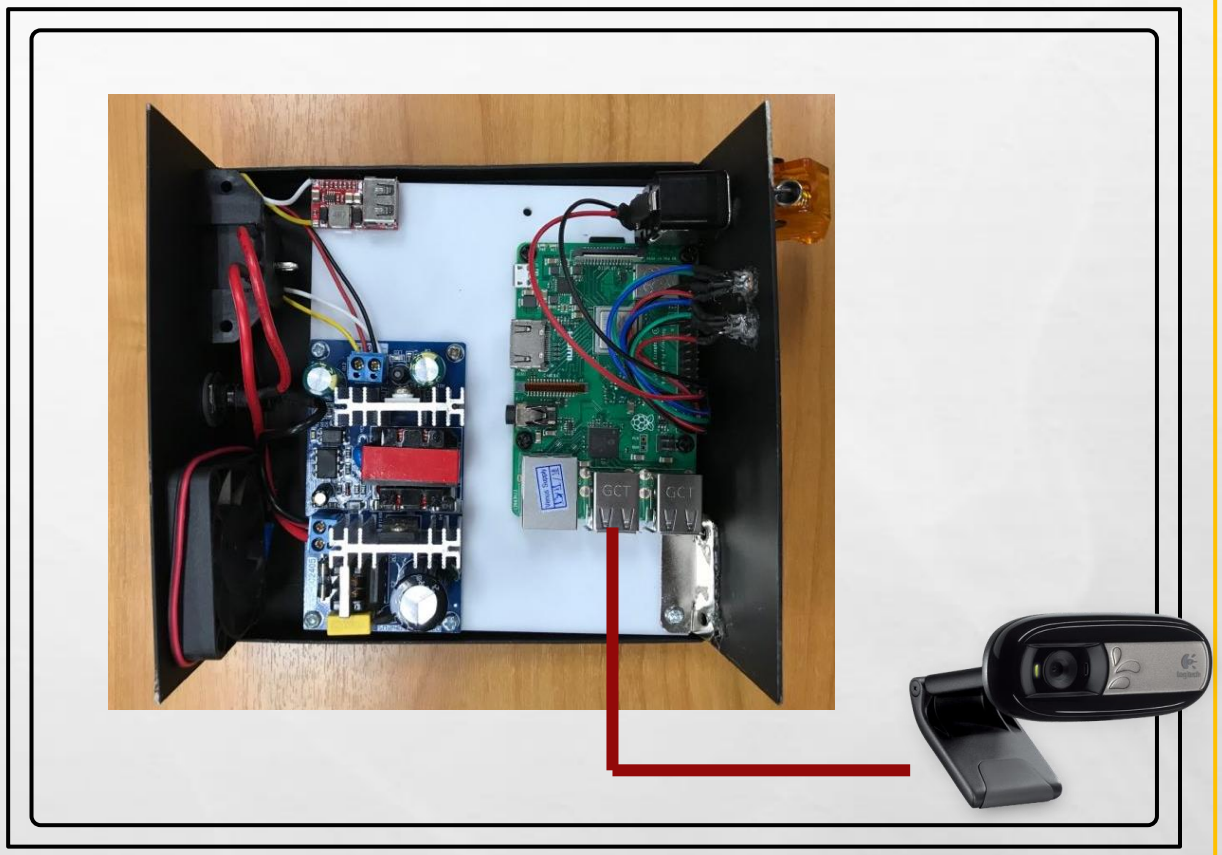
Version 1

Version 2

Model

บล็อกไดอะแกรมของ Model





HARDWARE DEVICES

LOGITECH WEBCAM C170

- **PHOTO: 5MP**
- **VIDEO: VGA**

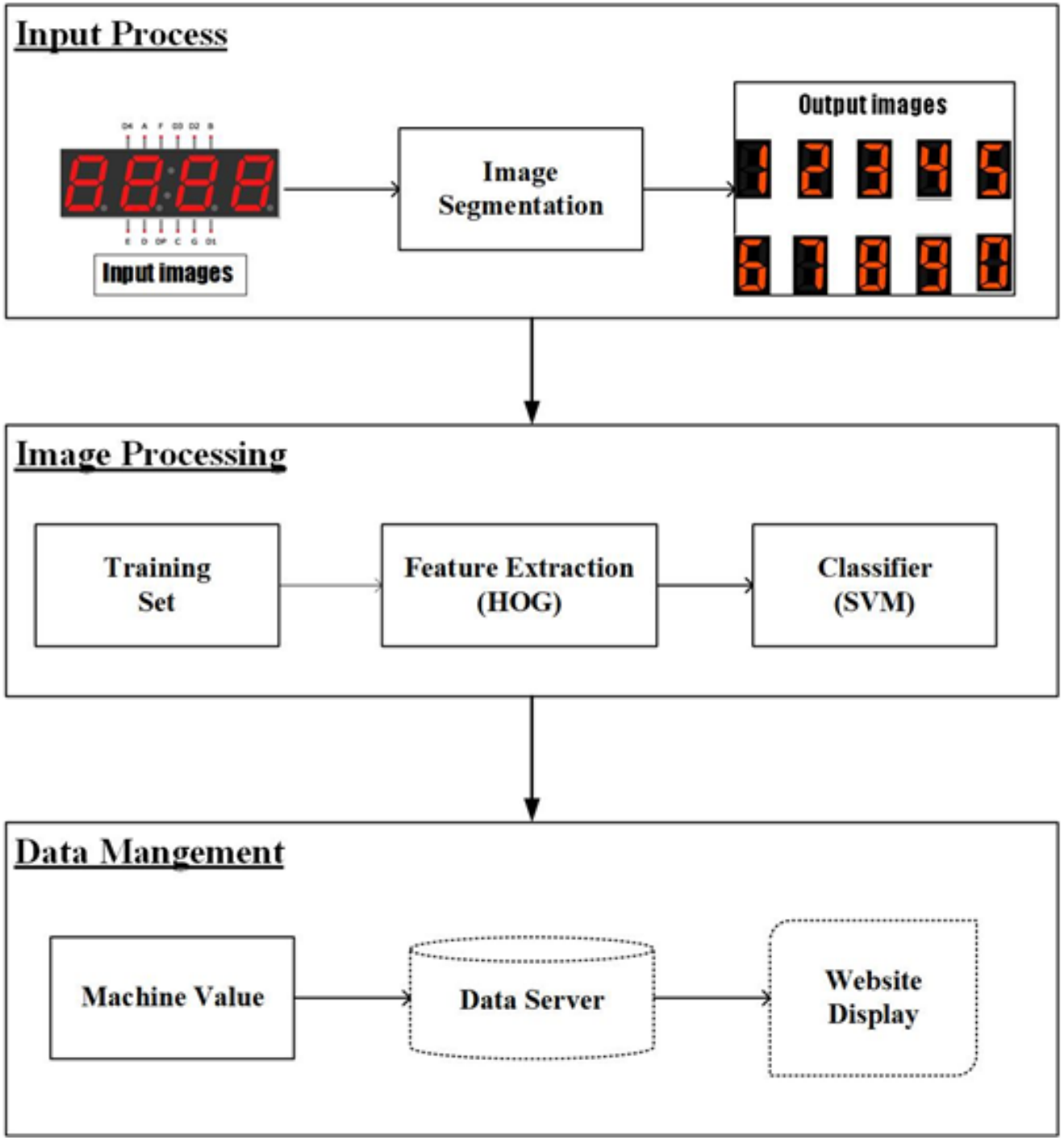
HARDWARE DEVICES

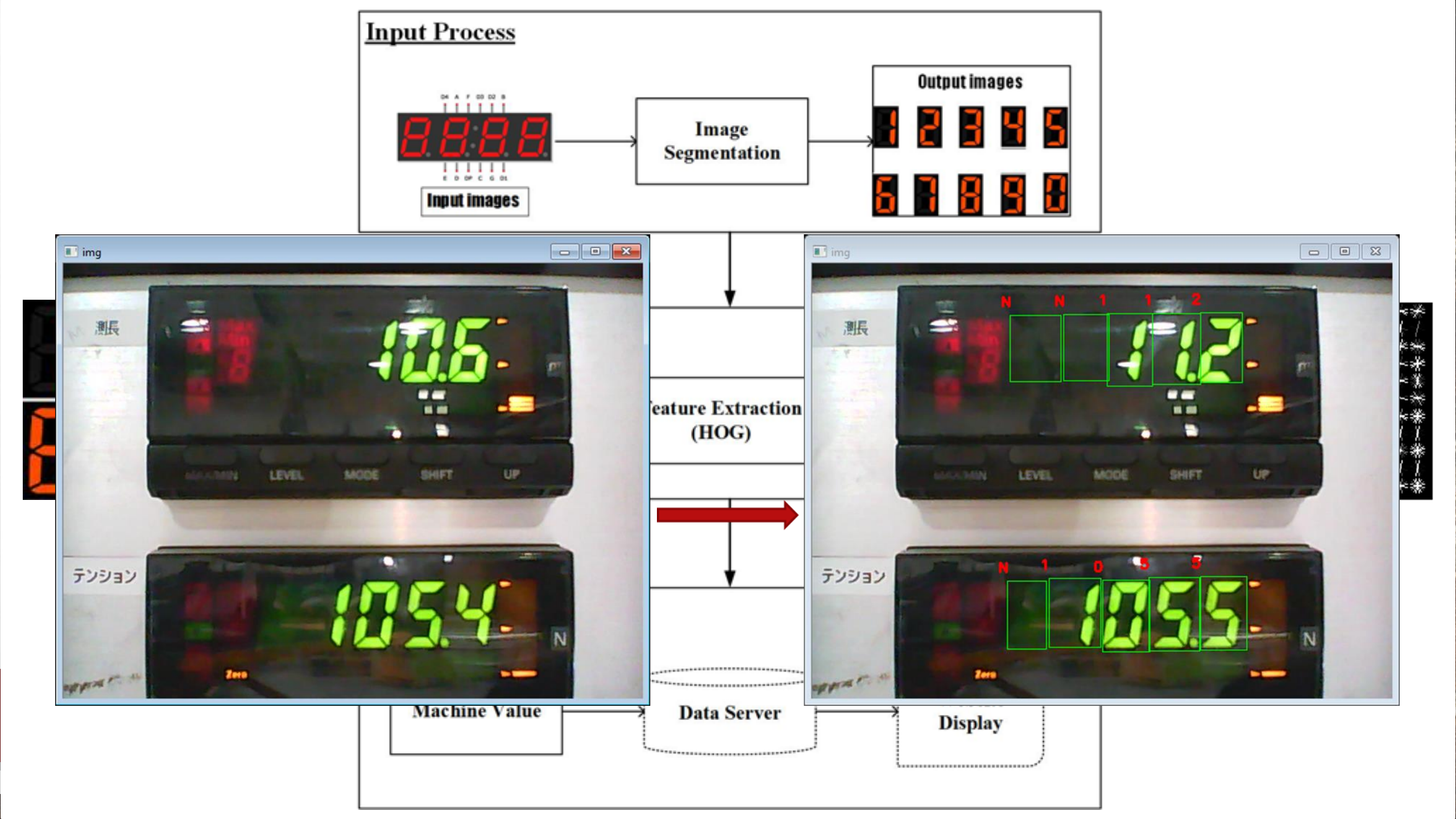
RASPBERRY PI MODEL B+

- CORTEX-A53 64BIT SOC @1.4GHZ
- 1GB LPDDR2 SDRAM
- 2.4GHZ AND 5GHZ WIRELESS LAN

SOFTWARE

- RASPBIAN: OS FOR RASPBERRY PI
- PYTHON: CONTROL CAMERA TO CAPTURE PICTURE AND TRANSFER THE DATA TO WEB SERVER
- OPENCV: INTERPRET PICTURE TO NUMERICAL DATA
- MYSQL: DATABASE
- PHP: CONNECT BETWEEN RASPBERRY PI MODEL B+ AND MYSQL
- BOOTSTRAP: WEBSITE
- DIGITAL OCEAN: WEB SERVER


Input Process
Input images
Image Segmentation
Output images
Image Processing
Training Set
Feature Extraction (HOG)
Classifier (SVM)
Data Mangement
Machine Value
Data Server
Website Display


Input Process
Input images
Image Segmentation
Output images
1 2 3 4 5
6 7 8 9 0
img
測長
10.6
LEVEL
MODE
SHIFT
UP
テンション
105.4
N
Zero
eature Extraction (HOG)
Machine Value
Data Server
Display
img
測長
N N 1 1 2
11.2
LEVEL
MODE
SHIFT
UP
テンション
N 1 0 5 3
105.5
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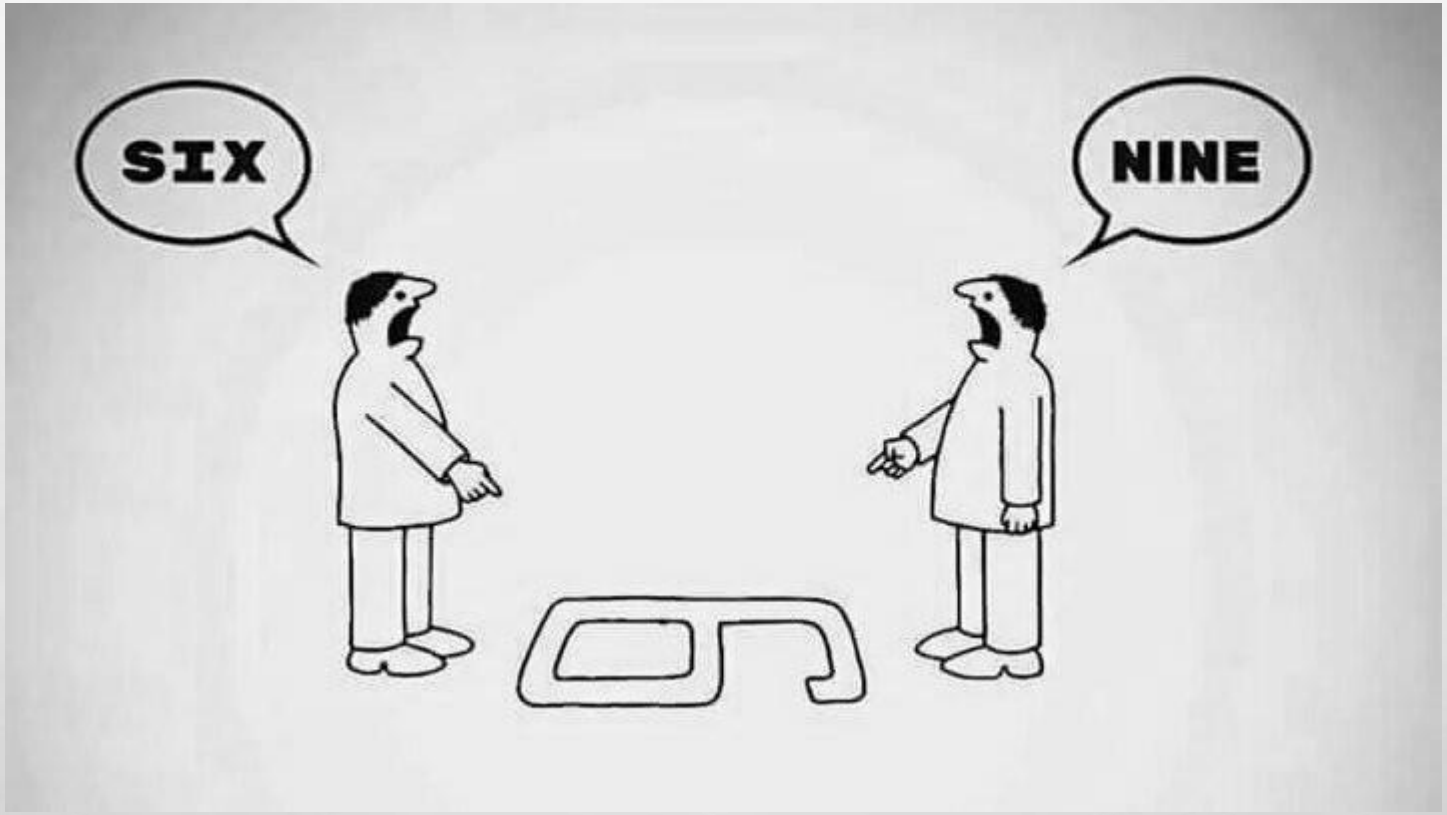
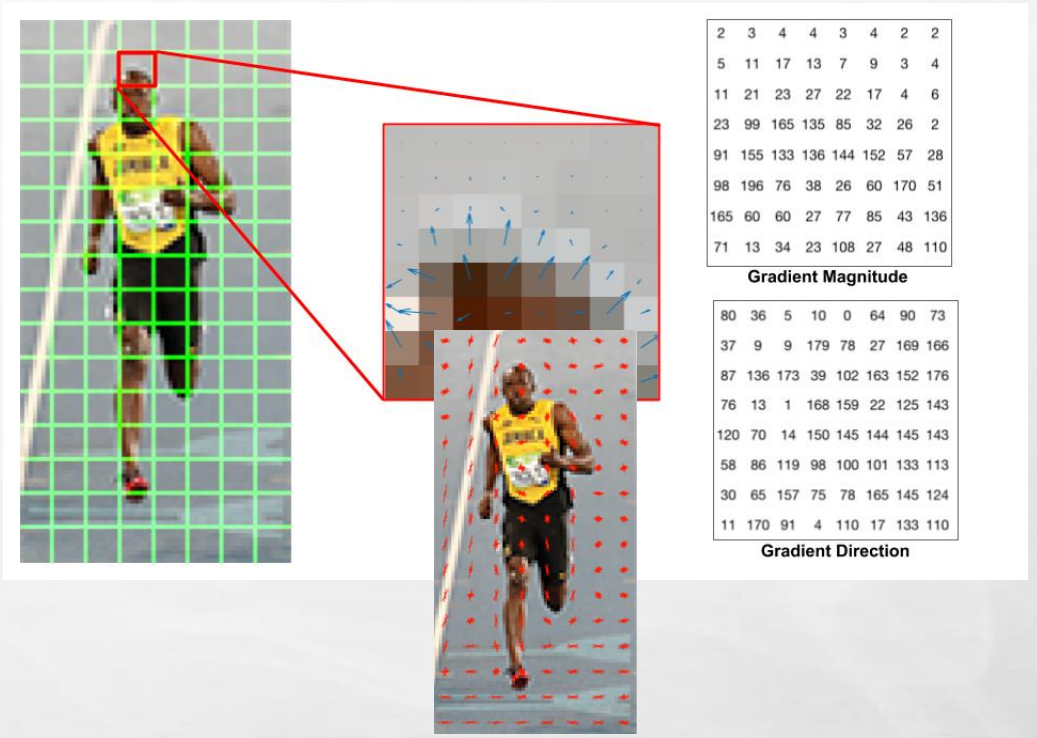
Zero

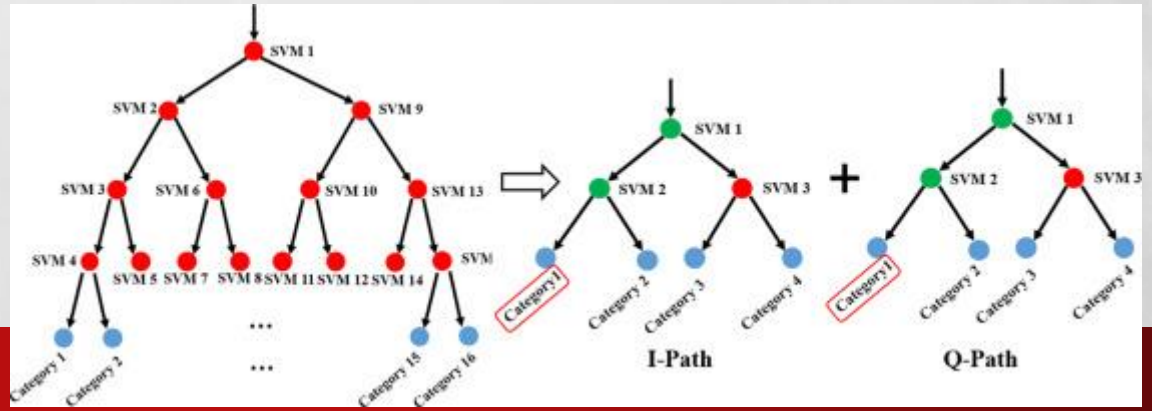
RECOGNITION

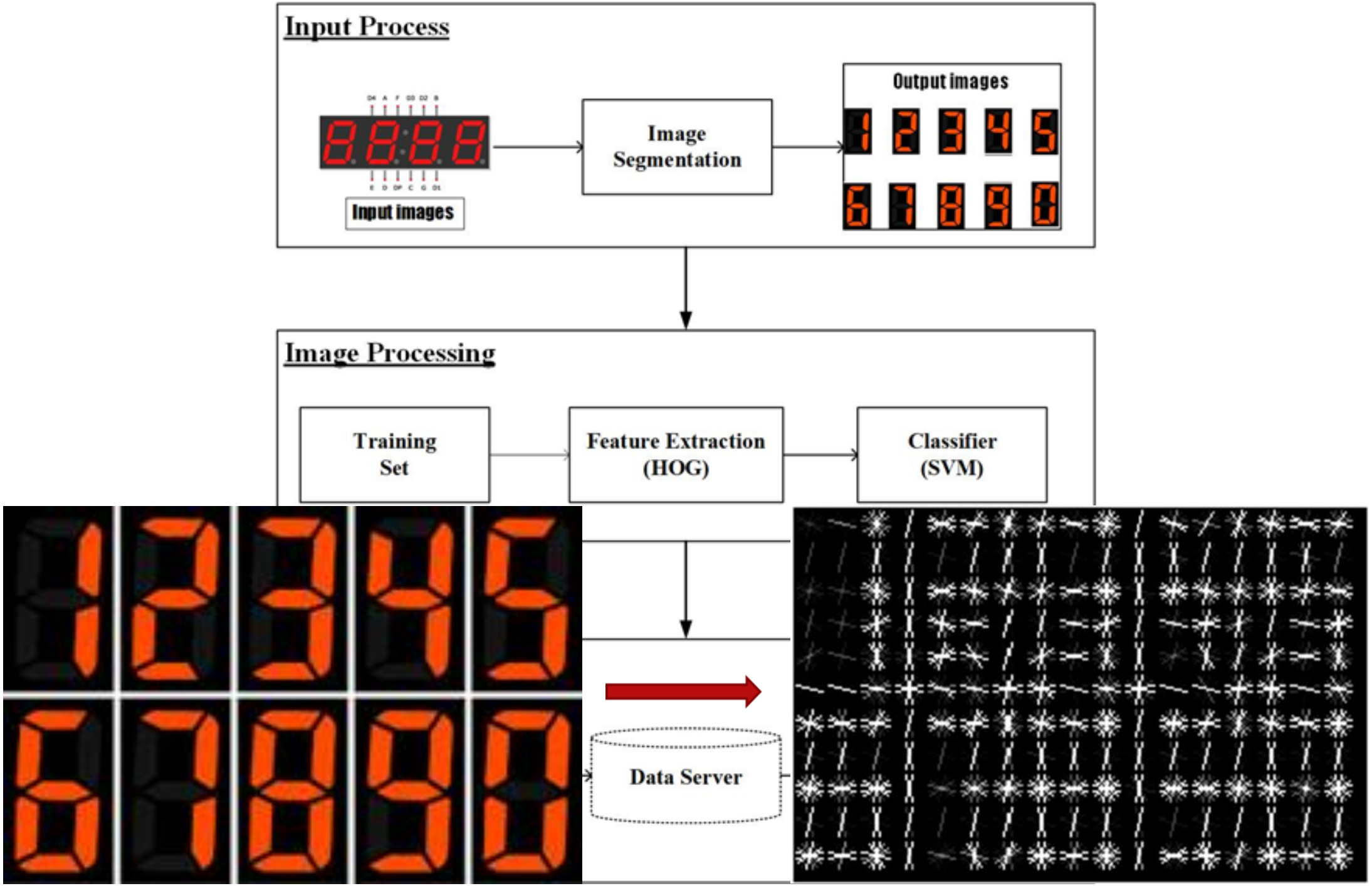


RECOGNITION

- HISTOGRAM OF ORIENTED GRADIENTS (HOG)
  - FEATURE EXTRACTION
- SUPPORT VECTOR MACHINE (SVM)
  - CLASSIFIER






Input Process
Input images
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Output images
Image Processing
Training Set
Feature Extraction (HOG)
Classifier (SVM)
Data Server


PROJECT
Search...
MENU
Dashboard
SiamWire
Machine2
Project1
Offline
51.3
62.3


กราฟแสดงระยะงาน
YTD
จากวันที่ พ.ค. 31, 2019
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กราฟแสดงแรงดึง
YTD
จากวันที่ พ.ค. 31, 2019
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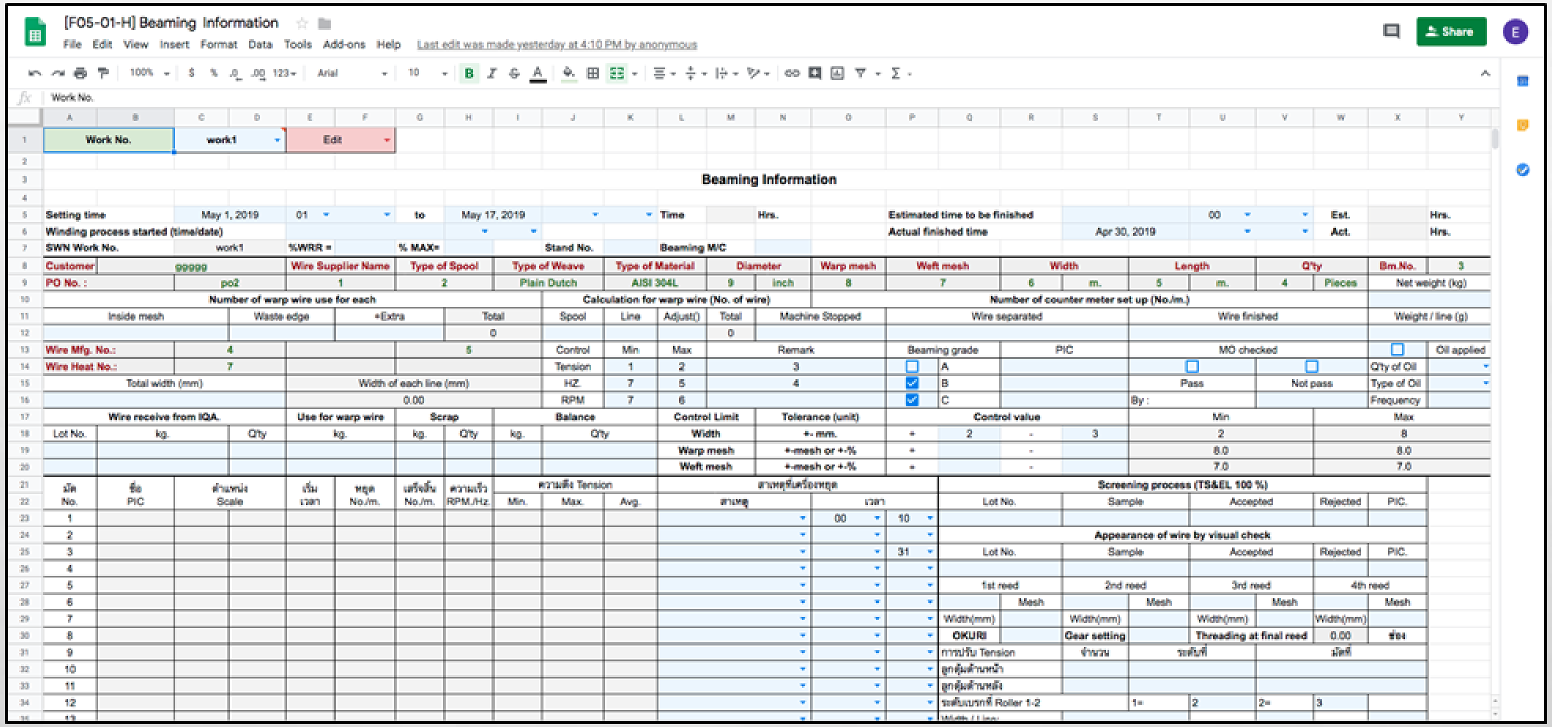
FINAL REPORT




Thank you
Tak
Dziękuję
Ευχαριστώ
Kiitos
Dziękuję
有り難う
Obrigado
谢谢
Hvala
有り難う
Terima kasih
Tack
תודה
Merci
Danke
Thank you
Gracias
ขอบคุณ
Grazie
謝謝
Спасибі
ありがとう
감사합니다
شكرا
謝謝
Dankon
Mulţumesc
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Хвала
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Köszönöm
Obrigo