

# PATTERN RECOGNITION & ROBOTICS AUTOMATION (PRA)

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- Associates Prof Ts. Dr. Mohd Ibrahim Shapiai, Associate Professor
- Dr. Uswah Khairuddin, Senior Lecturer
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## NUMBER OF STUDENTS

- Ph.D : 20 students
- Master: 12 students
- Bachelor: 46 students

## RESEARCH KEYWORDS

### AI, ROBOTICS AND CONTROL

Artificial Intelligence, Brain Computer Interface and Swarm Intelligence, Machine Vision, Design Optimization and Workflow, Low Carbon Transport, Automotive Turbocharger, Nonlinear Control, Multiple Agent System, Warehouse Management System, Supply Chain.



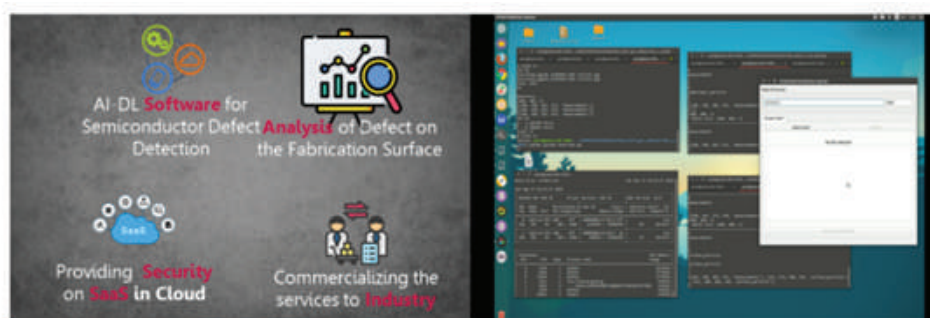
## OUTLINE OF IKOHZA

Pattern Recognition and Automation ikohza develops frontier intelligent systems for industries towards wealth creation also promote and disseminate the knowledge of artificial intelligence and robotics technologies state of the art intelligent system solutions to society.

## CURRENT RESEARCH

### 1) DEFECT INSPECTION USING DEEP LEARNING COMPUTER VISION FOR SOFTWARE AS A SERVICE

Providing an intelligent and secured solution for defect inspection in semiconductor industries.



Main Features

Prototype Defect Inspection



### 2) AI INVENTORY MANAGEMENT SOLUTION FOR LOGISTIC & RETAIL INDUSTRIES

AI Inventory Management System can be turned into rich insights in areas such as operation analysis for warehouse management and retail analytics. It would greatly benefit logistic industries by ensuring a consistent and accurate reporting and cycle counting process.



Location information (Items)



Time to move (Pick, Pack, Transport)



Auto classification for each item

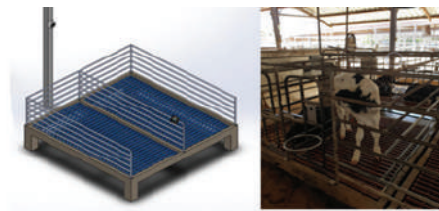


Connected with warehouse drawings



### 3) ARTIFICIAL INTELLIGENCE VISION SYSTEM FOR CALF WEIGHT ESTIMATION

The purpose of this project is to reinvent calf monitoring and rearing practices and re-evaluate its rearing costs using precision veterinary surveillance system specifically built for dairy youngstock.



Precision Calf monitoring in Collaboration with UPM

#### MERIT OF THE TECHNOLOGY

- Our server comes with power GPU which can support the deployment of AI system.
- Our project now collaborates with Semiconductor industries.
- The developed technology magic starts with in-store cameras that capture real-time shelf conditions with pixel-perfect accuracy to identify each SKU.
- By automating and continuous shelf scans, warehouse in Osaka, Japan can improve labor efficiency, increase item availability, more importantly faster cycle counting.
- Develop a precise calf weight monitoring system based on machine vision and deep learning algorithms which can provide daily calf weight estimation.
- Develop optimized calf feed intake and medicine modules based on its precise weight estimation and common dairy farming and veterinary practices.
- Estimate the costs of rearing using stochastic bioeconomic model that includes feed and medicine costs as well as fatality losses and to evaluate factors that influence the adoption of technology.

#### POSSIBLE INDUSTRY APPLICATION

As a premier university-based research laboratory, our lab is well-equipped with the state-of-the-art intelligence system solutions to society. We provide open access, hands-on-training, and courses to the entire university also to external users from both academia and industry. We have strong linkages and networking with both academic institutions and industrial sectors.

#### POTENTIAL COLLABORATIVE AREA:

- Research-Development-Commercialization-Innovation;
- Community Engagement Training/ Workshops / Seminars;
- Provide AI consultancy for livestock, manufacturing and supply chain industries.

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