

PROJECT PROPOSAL

COMPANY NAME

ABB AUTOMATION and ELECTRIFICATION (Vietnam) Company Limited

CONTACT DETAILS

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Support URL:

- [FlexLoader SC 3000 Extended with deburring and air cleaning - YouTube](#)
- [FlexLoader Vision for Machine Tending - YouTube](#)
- [ABB Project Diagram: Lucidchart](#)

PROJECT TITLE

Flexible loading station with vision guide

PROJECT DESCRIPTION

- **What is the problem domain?**
 - Web, android/IOS: HMI – Human Machine Interface on Web or App
 - Machine Learning: Teaching object recognition
 - Cloud, networking: Database after teaching – ML
 - Embedded systems: Embedded C Language – Robot Studio – Simulation before real testing on ABB robot system (70-80% of the total process)
 - IC design: No need for now
 - Robotics: Robotics knowledge e.g., image processing, mechanics, robot movement
 - Autonomous Systems, and Automation: Robot Vision and G – Code (But we will skip that since we have Robot Studio, just coding embedded C)
- **Describe the project:**
 - Objectives
 - Context
 - External interfaces (Connection)
 - GUI (Graphical User Interface) – UI

This is applied to load materials into processing machines, materials are lied on the infeed **Conveyor**. This system can be used for many kinds of materials with very quick changeover time **or mixed loading**.

TECHNOLOGY

What technologies will be used in the project: Languages, Algorithms, DB – Database, IDE – Integrated Development Environment, Design tools/products, Development methodologies, etc.

+ Vision (PC base – Camera + Station is already set up)

- + HMI on Window (WPF – Window Presentation Foundation (.NET framework. - Before proceeding with this tutorial, you should have a basic understanding of XML, Web Technologies, and HTML.), VB – Visual Basic, VS – Visual Studio, ... – Python Code)
- + ABB robot
- + CNV = Conveyor, sensor, gripper, ... (just know how to the sensor and robots communicate with the others)

PROJECT DELIVERABLES

- **What are the expected outcomes/deliverables of this project?**
 - Web application, or mobile application
 - Working prototype
 - Recommendation engine – Part of ML ([Lecture 16.2 — Recommender Systems | Content Based Recommendations — \[Andrew Ng \] - YouTube](#)) – Not focus now
 - etc.
- **What we need for now:**
 - Image processing application on PC
 - HMI for easy operation
 - Robot-Vision integrated to teach/ change products.

SUCCESS CRITERIA

Provide a clear, well-defined, quantitative metric that will be used to measure success – e.g., actions/per second, %accuracy, time to complete task, %improvement, etc.

- + Vision can recognize product on CNV – conveyor to guide the robot to pick
- + Robot pick and place with a customized program
- + Can change products and re-define pick point on HMI easily
- + System can run mixed products

TECHNICAL/PROFESSIONAL SKILLS REQUIRED

Please indicate any specific skills you believe are required for the project

- + Engineering background
- + Mechanical hardware design capable
- + **Programming with C/C++ (Embedded Sys)**
- + **Image processing application-related (OpenCV – Python)**

AVAILABLE RESOURCES

Hardware/software/other resources that will be made available for the team
Robot, Conveyor.

INTELLECTUAL PROPERTY: So Huu Tri Tue

IP belongs to the sponsor. A WIL (Work Integrated Learning) agreement will be signed at the start of the project.

Agreed

OTHER CONSIDERATIONS or INCENTIVES

E.g., Scholarship available/future work available, etc

The internship is available.