



Company Information

Company Name	J&L Machine and Fabrication	Date Submitted	04/30/2026
Project Title	Utilizing computer vision processing and use of AI to automate different processes in manufacturing (J&L_VISION)	Planned Starting Semester	Fall 2026

Senior Design Project Description

Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project.

Please provide your estimate of staffing in the below table. The Senior Design Committee will adjust as appropriate based on scope and discipline skills.

Discipline	Number	Discipline	Number
Mechanical	1-3		
Computer	2-3	Systems	1-3

Company and Project Overview:

- J&L is a precision Fabrication and Machining provider focusing on Fabrication, Precision machining and Powder coat applications.
- Services include: CNC forming, turning, milling, laser cutting, part bending, welding, and painting
- Customers like Daimler Mercedes Truck Division purchase parts from J&L for their assembly like brackets, chassis plates, shafts, etc.
- Website: <http://jlmaf.com/>

	This project is partially supported by a grant from the NC Manufacturing Extension partnership, an organization the helps to support business and job growth for NC companies. To learn more about the NC MEP, click on this link: https://www.ncmep.org/.
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- The team will be instructed to utilize computer vision processing of images to automate processes. During the initial meeting with the students, J&L will show the team various workcells that the project could focus on. Examples would be workcells involving tracking inventory, counting parts being placed on a pallet, checking weld placement or orientation of parts being formed. The student team will choose one of the examples they are given to be the objective for the project.

Project Requirements:

- Students review all the provided sub-projects then make a choice as to which one to do for the project.
- Analyze overlap of technological requirements to decrease development time
- Produce a functioning prototype computer vision system
- Install prototype to test reliability in a live production environment
- Track results of prototype to validate efficacy and adjust if needed
- Robust error handling if any issues do arise with the system

Expected Deliverables/Results:

- Estimate for time requirement and value added for the project
- Functioning system that is collaborative with human employees and reliable in the environment
- For selected workcell, include machine learning to optimize performance
- A working system that has been tuned for the environment that it will be installed in.
- Verification testing at J&L

Disposition of Deliverables at the End of the Project:

Students are graded based on their display and presentation of their team's work product. It is mandatory that they exhibit at the Expo, so if the work product was tested at the supporter's location, it must be returned to campus for the Expo. It is also a mandatory part of this Program that the Industry supporter attend the 2 expos to grade their team's performance. After the expo, the team and supporter should arrange the handover of the work product to the industry supporter. This handover must be concluded within 7 days of the Expo.

List here any specific skills, requirements, specific courses, knowledge needed or suggested (If none please state none):

- Experience or interest with computer vision algorithms and machine learning