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JTEKT Bearing Painter
VDR 1

Senior Design Team 515

Team Introductions

Mason Gibson
Manufacturing Engineer

Wesley Jean-Pierre
Mechanical Design Engineer

Max Jones
Project Manager & Control Engineer

Andrew McClung
Systems Integration Engineer

Anthony Wuerth
Manufacturing & Design Engineer

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Sponsor and Advisor

Engineering Mentor
Joshua Jones
Process Engineer
JTEKT North America

Academic Advisor
Shayne McConomy, Ph.D.
Senior Design Professor

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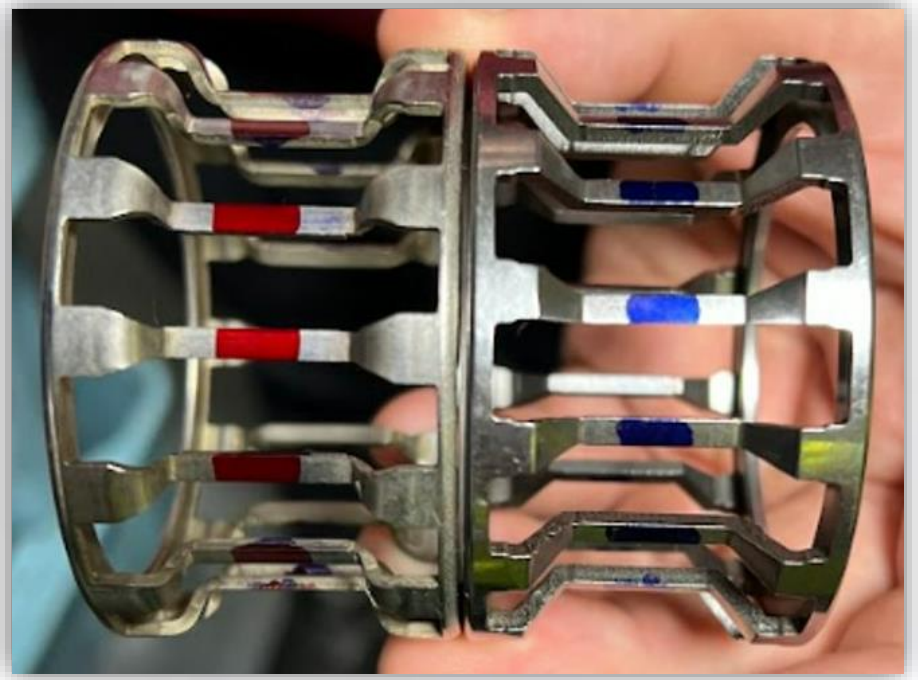
Project Objective



The objective of this project is to automate the process of painting needle bearing retainers.

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Project Background

Anthony Wuerth

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Needle Roller Bearings

Used in:

- Transmissions
- Engines
- Suspension
- Aviation
- Aerospace

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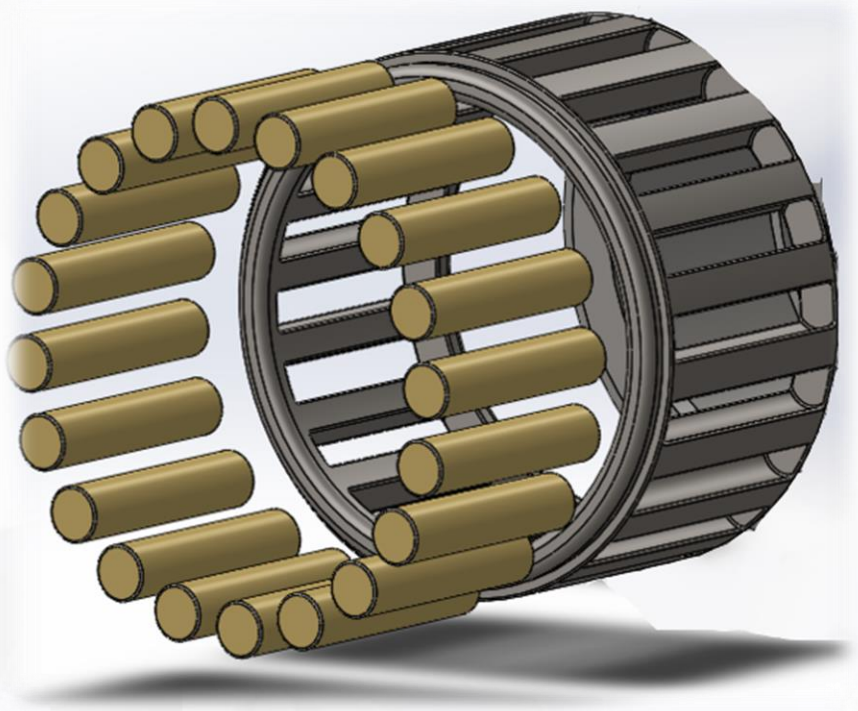
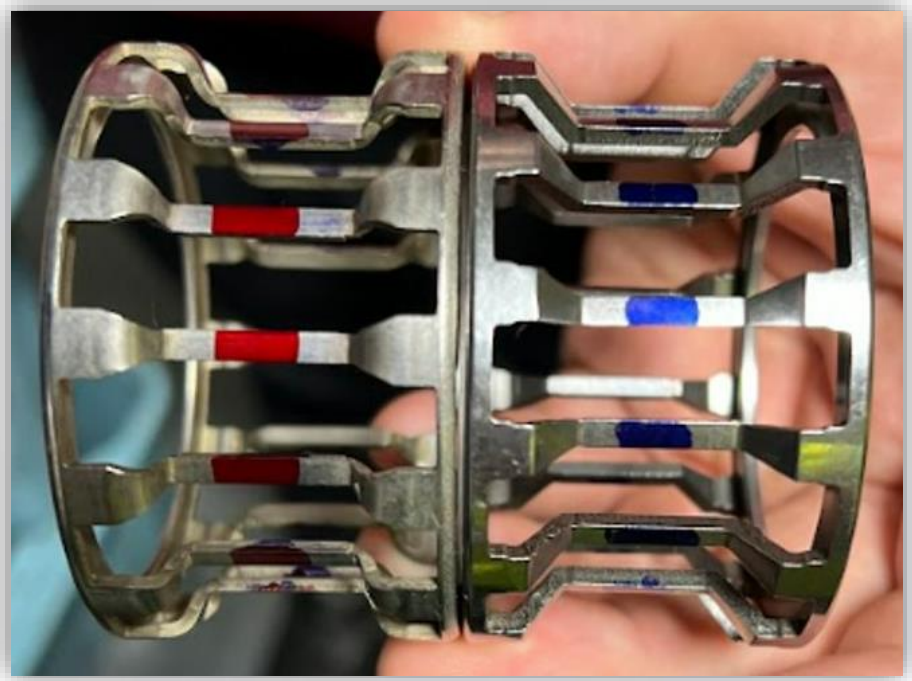
Needle Roller Retainers

Used to Hold Needles in Place:

- Cylindrical Rollers
- Higher Max Loads
- Rotation Must be Constrained



Retainer Painting



Some Customers Require Part Marking To Help Distinguish Similar Parts

- Low Production Runs
- Tedious, Manual Process
  - Operator Pulled From Position
    - Decreased Efficiency

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Project Scope

Max Jones

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Key Goals

Accurately Apply Metal Paint to Bearing

Accommodate a Wide Range of Bearings

Automate Bearing Painting Process

Assumptions

- Manually Loaded and Unloaded
- Loaded with One Type of Bearing at a Time
- Powered by a Standard 120V Wall Outlet
- Paint With one color per Load

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Markets

- Primary
  - JTEKT
- Second
  - Industrial Manufacturing Plants
  - Mass Production Industries
  - Automotive Industries

Stakeholders

- JTEKT
- FAMU-FSU College of Engineering

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Customer Needs

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Customer Needs

- Fully Automated
- Fit Into Existing Fume Hood
- Accommodate Different Sized Bearings
- 3 Second Cycle Time
- Paint Non-Working Surface Only

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Functional Decomposition

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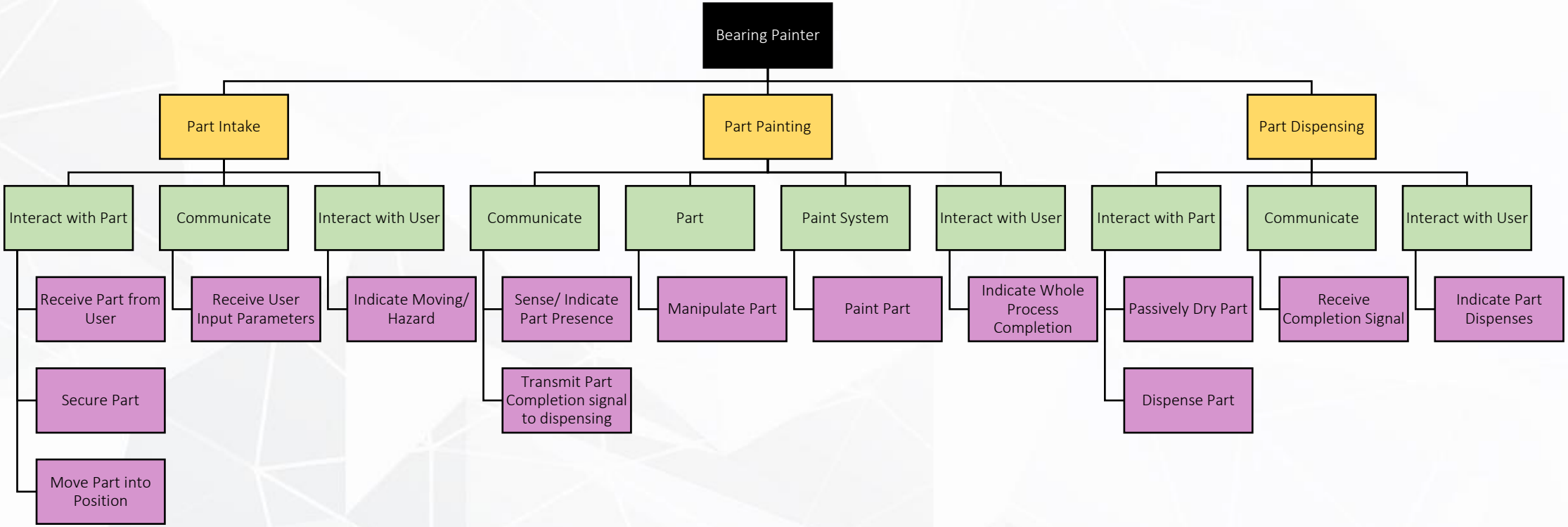
Functions Hierarchy Chart



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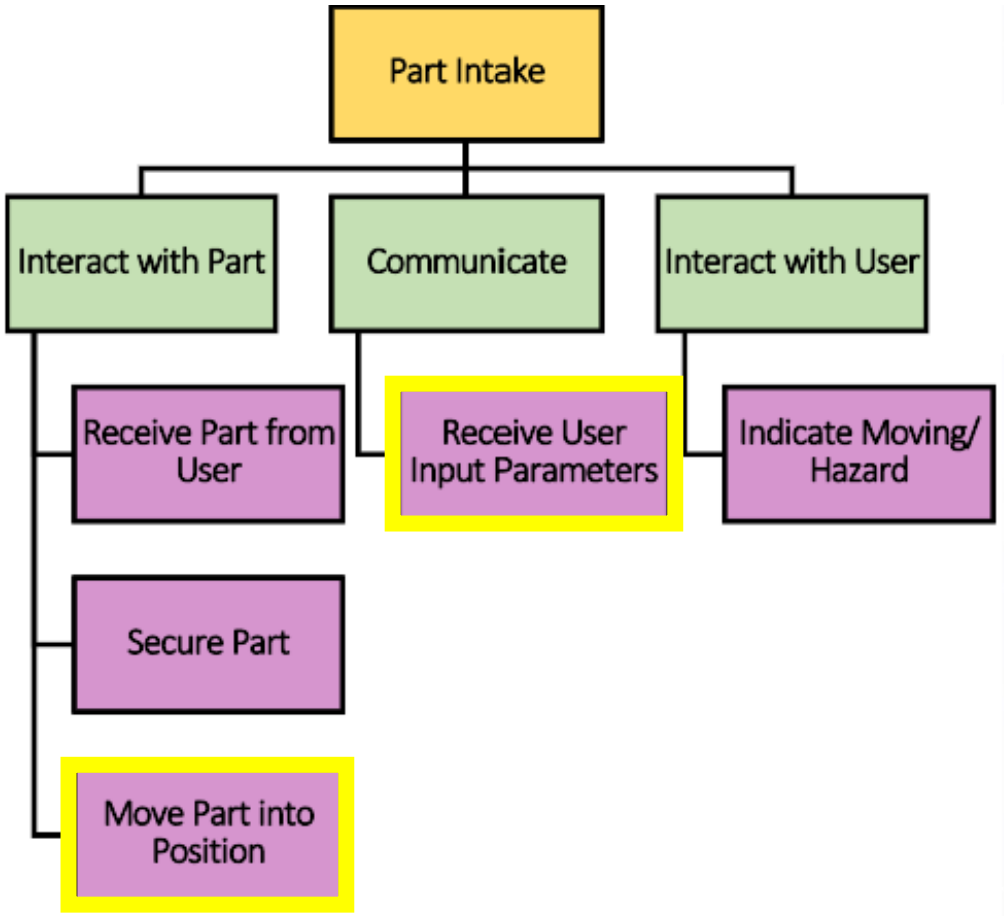
Part Intake



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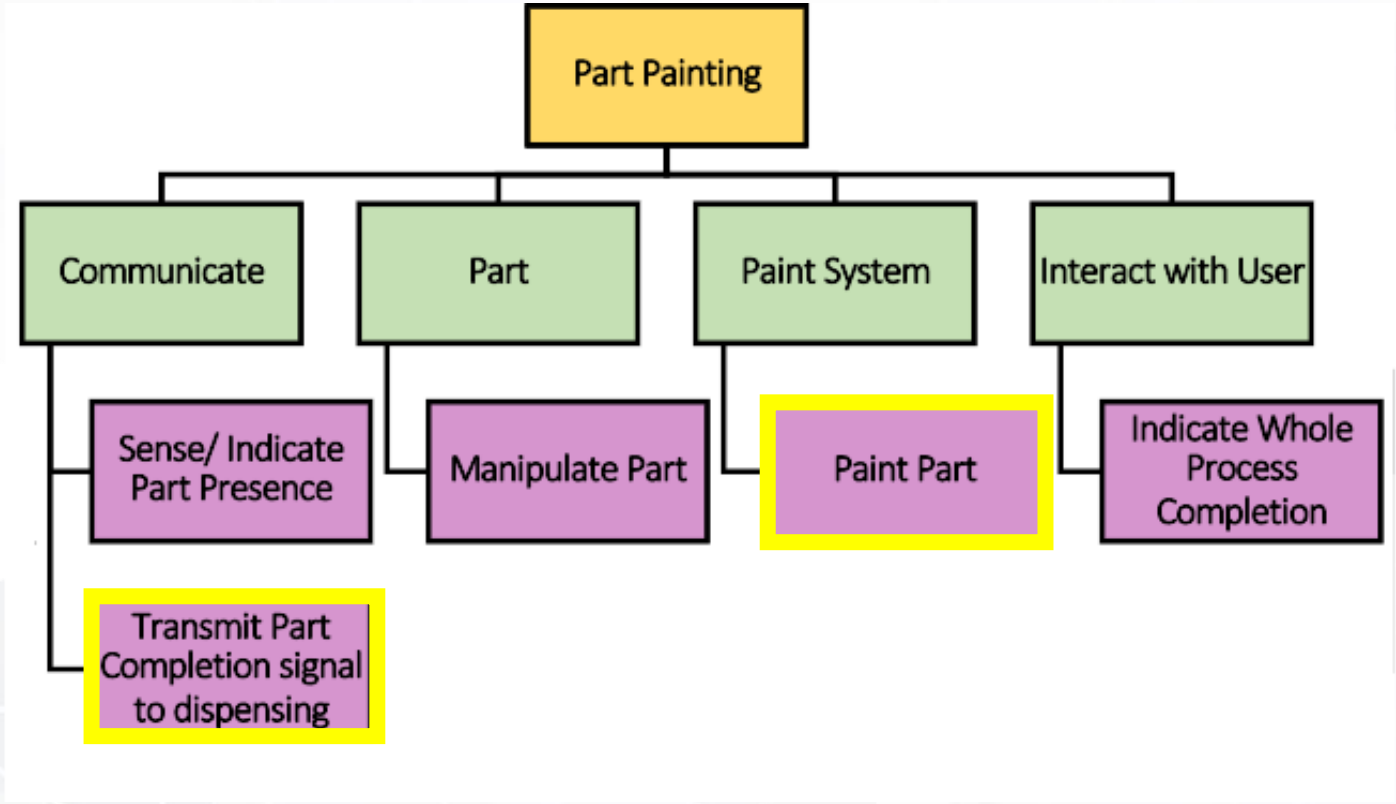
Part Painting



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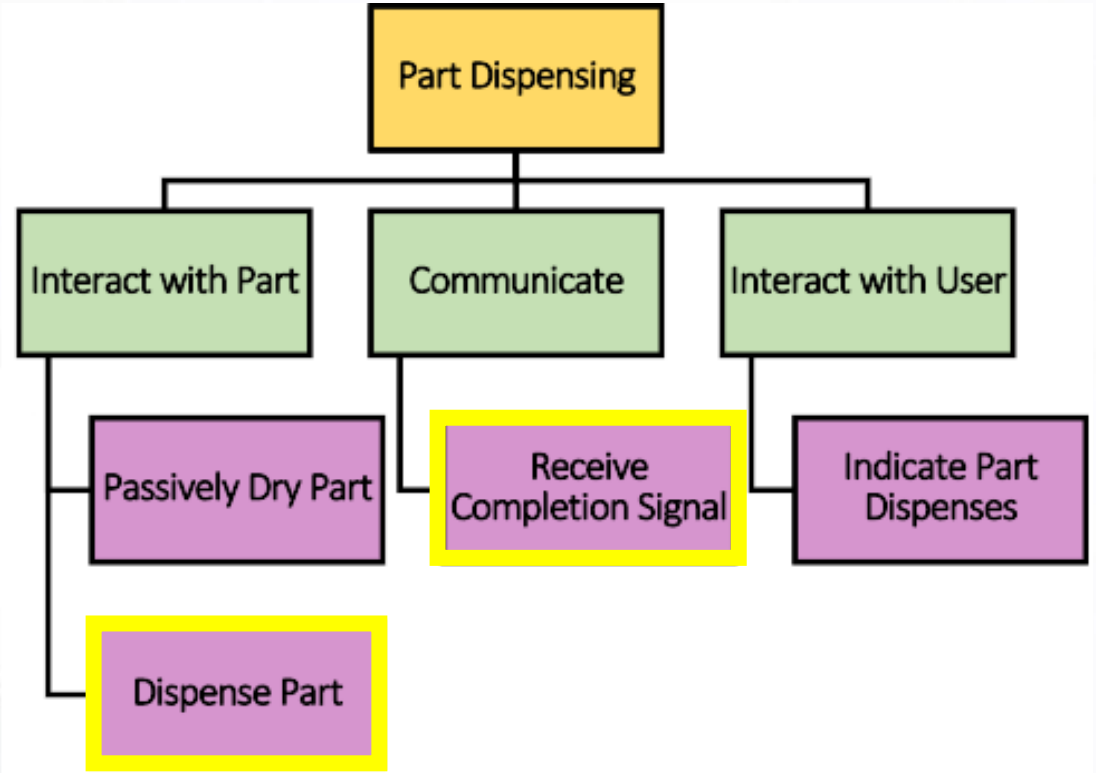
Part Dispensing



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Future Work

- Testing With DYKEM
- Concept Generation & Selection
- Prototyping

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Questions?

- Team Introduction
- Project Objective
- Project Background
- Project Scope
- Customer Needs
- Functional Decomposition

Backup Slides

- This is 10-point
- This is 15–point Times
- This is 20–point
- This is 25–point
- This is 30–point
- This is 35–point
- This is 40–point
- This is 50–point
- This is 60–point