



GRAND VALLEY  
STATE UNIVERSITY®

SEYMOUR AND ESTHER PADNOS  
COLLEGE OF ENGINEERING  
AND COMPUTING

**Co-op Employer Forum**  
**Maximizing the Benefits**  
**of an Industry / University Collaboration**



**Wael Mokhtar, Ph.D.**

Director, School of  
Engineering, Padnos  
College of Engineering &  
Computing

Grand Valley State  
University

Welcome  
Brief Introductions  
Thank You to School of  
Engineering Constituents



**Diane LaFreniere**

Sebastian Chair,  
Assessment,  
Accreditation &  
Cooperative Education,  
School of Engineering,  
Padnos College of  
Engineering & Computing

Grand Valley State  
University

Welcome  
Thank You to School of  
Engineering Constituents  
Co-op Awards



**Chris Babbitt**

Assistant Director  
Career Center

Grand Valley State  
University

Q&A Facilitation  
Final Closing Remarks &  
Thank You





**Mary Andrade**

Director, Engineering  
Career Services  
J.B. Speed School of  
Engineering

University of Louisville

Topic: ASEE CEED  
division support for  
cooperative and  
experiential learning



**Steve Heethuis**

Training Director  
NN Autocam Precision  
Components Group

Topic: NN Autocam's  
collaboration with the  
GVSU School of  
Engineering



**Paul D. Plotkowski, Ph.D.**

Dean, Padnos College of  
Engineering &  
Computing

Grand Valley State  
University

Topic: GVSU Innovation  
Design Center



**Casey Thelenwood**

Assistant Dean, Padnos  
College of Engineering  
& Computing

Grand Valley State  
University

Topic: Opportunities for  
industry to connect  
with the Padnos  
College of Engineering  
& Computing

**5**

**WAYS TO  
ENGAGE**

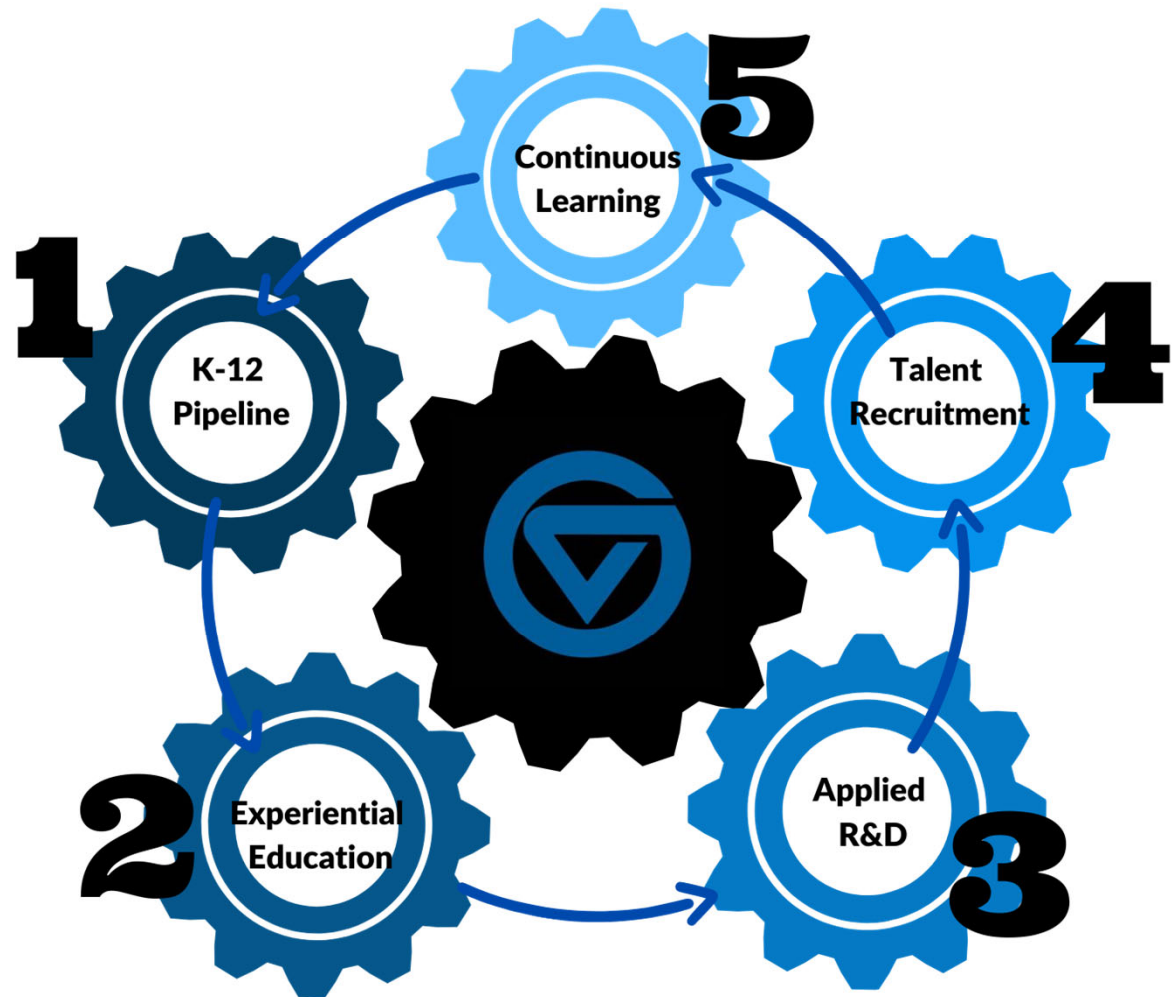
**35+**

**YEARS OF  
EXPERIENCE**

**300+**

**INDUSTRY  
PARTNERS**

# INDUSTRY CONNECTIONS







# K - 12 PIPELINE

**500+**

**INDUSTRY  
VOLUNTEERS**

**18+**

**YEARS OF  
SUMMER CAMPS**

**13,000**

**K-12 STUDENTS  
REACHED ANNUALLY**

## **PCEC K-12 Commitment**

- Dedicated Outreach Space & Staff
- Hands-on Workshops (Offered at Local Schools or GVSU Campus)
- Summer Camps to Expose K-12 Students to STEM
- STEM Career & Project Showcases
- Attendance at K-12 Career Fairs & Events
- Advising for Pre-college Students

## **Industry Engagement Opportunities**

- Volunteer
- Provide Content Expertise
- Sponsor a Summer Camp or Event
- Host a Table at STEM Career Showcases
- Provide Job Shadowing Opportunities



# EXPERIENTIAL EDUCATION

**100%**

PCEC GRADUATES  
COMPLETE CO-OP  
OR INTERNSHIP

**30+**

YEARS OF  
EXPERIENCE

**1,500+**

HOURS OF  
ENGINEERING CO-OP  
EXPERIENCE

**100+**

CLASSROOM  
PROJECTS PER  
SEMESTER

**300+**

INDUSTRY  
PARTNERS

## PCEC Experiential Education

- All PCEC Students Complete Mandatory Co-op or Internship Experiences
- High-impact Learning in PCEC Courses through Industry-sponsored Projects
- Lab Components Built into Many Courses
- Student Access to State-of-the-Art Facilities & Equipment

## Benefits to Students

- Obtain Real-World Experience
- Graduate Prepared to Enter the Workforce

## Industry Engagement Opportunities

- Hire Co-op or Internship Students
- Industry-sponsored Course and Capstone Projects

## Benefits to Industry

- Access to Student & Faculty Expertise
- Gain Brand Exposure & Awareness
- Solve Problems at Low Cost
- Determine Organizational Fit of Student Employees Before Making a Career Hire
- Hire Graduates with Significant Professional Experience





# APPLIED RESEARCH & DEVELOPMENT

**5**

**APPLIED R&D CENTERS**

## **PCEC Applied R&D Centers**

- Applied Computing Institute (ACI)
- Applied Medical Device Institute (aMDI)
- Design, Optimization, Evaluation, & Redesign (DOER) Center
- DTE Electromagnetic Compatibility (EMC) Center
- Power Mobility Lab (PML)

**25+**

**PROJECTS PER YEAR**

## **Opportunities for Industry**

- Access to Student & Faculty Expertise
- Incubator Space
- Rapid Prototyping
- Experimental Design
- EMC Related Product Design and Pre-Compliance Testing
- Application Development
- 3D Additive Manufacturing

**85+**

**EXPERT FACULTY**



# TALENT RECRUITMENT

**70%**

**PCEC GRADUATES  
REMAIN IN WEST  
MICHIGAN**

**75%**

**PCEC GRADUATES OFFERED  
CAREER HIRES BY CO-OP OR  
INTERNSHIP EMPLOYERS**

**99%**

**PCEC GRADUATES  
EMPLOYED OR ATTENDING  
GRADUATE SCHOOL**

## **Building the STEM Workforce**

- K-12 Outreach Contributes to Talent Pipeline
- HBCU / HSI Pipeline Consortium Diversifies Talent Pipeline in West Michigan
- Experiential Education Provides Brand Awareness for Industry and a “Trial Run” in Identifying Candidates
- Robust Research Opportunities & Dedication to Student Success Attract Faculty to GVSU
- Approximately 70% of Graduates Remain in West Michigan (Only 30 – 40% from West Michigan)
- Commitment to Maintaining Strong Industry Partnerships





# CONTINUOUS LEARNING

**8**

**GRADUATE-LEVEL  
BADGES IN  
COMPUTING**

**30+**

**ONLINE OR  
HYBRID COURSE  
OFFERINGS**

**2**

**INDUSTRY  
PARTNERS  
IN-RESIDENCE**

**10+**

**ANNUAL PROFESSIONAL  
DEVELOPMENT  
WORKSHOPS OFFERED**

## **Meeting the Need for Ongoing Professional Development**

- Online and Hybrid Course Offerings
- Graduate-level Badges and Modularized Learning
- On-ramps for Professionals in Other Industries to Enter STEM Careers
- Short-term, Skill-specific Professional Development
- Mutually-beneficial Industry Partnerships
- Emphasis on Broad Knowledge vs. Career-specific Training



# Innovation Design Center

 GRAND VALLEY STATE UNIVERSITY

## A FACILITY TO SUPPORT:

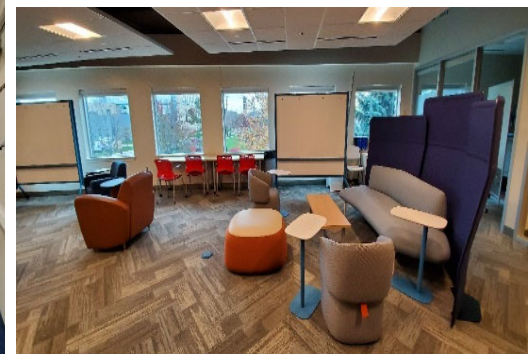
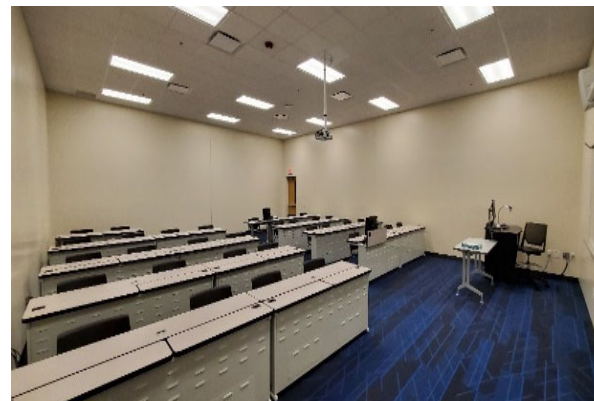
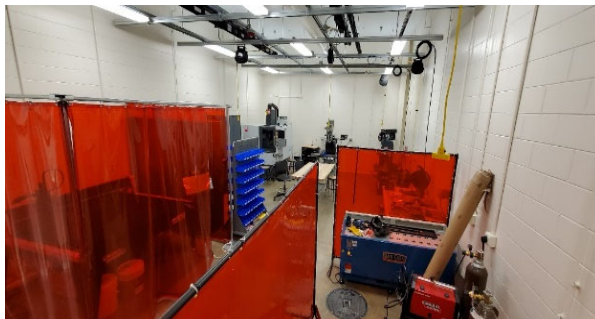
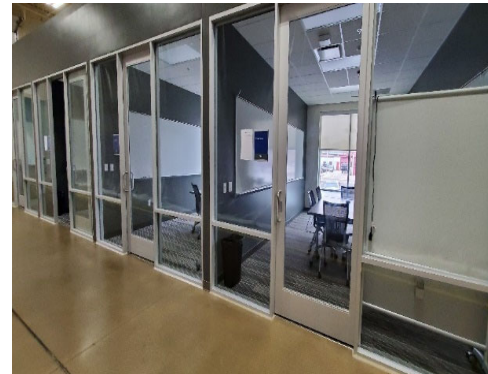
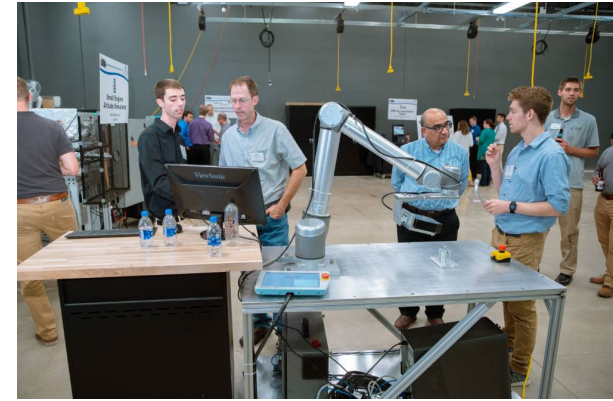
- Industry-Based Projects & Project-Based Learning
- K-12 & Community Engagement
- Industry Support & Engagement

*PHILOSOPHY: Leverage the synergy between these efforts to provide enriched and integrated programming for our students and community*



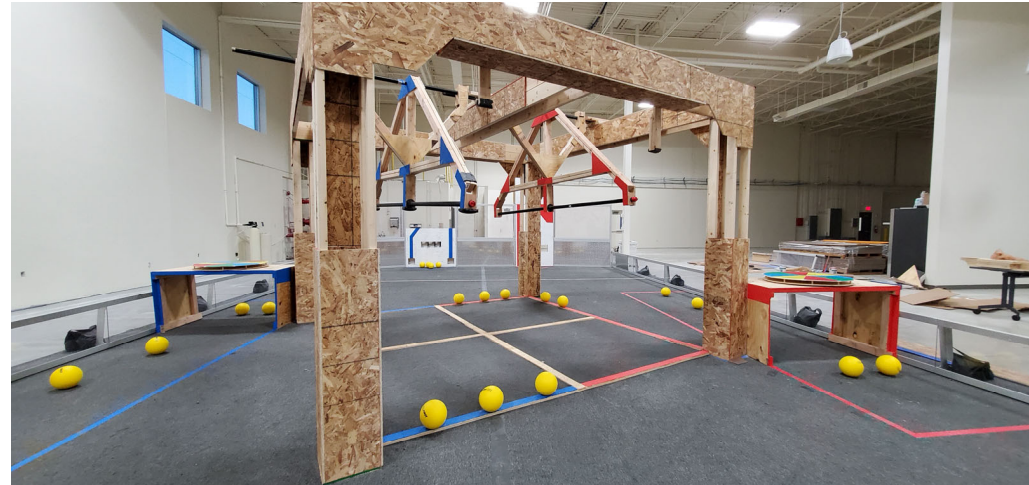
# Industry-Based Projects & Project-Based Learning

- Flexible Project Labs
- Team Rooms
- Rapid Prototyping Lab
- Fabrication Lab
- Digital Design Studios
- Free Form Collaboration Spaces



# K - 12 & Community Engagement

- Dedicated space
- Flexible classroom / conferencing
- White board dividers
- Flexible factory floor space supports:
  - FIRST Robotics
  - STEPS Summer Camps
  - Design Conferences
  - Adjacent to Art Facility









## Company Overview



NN, Inc. is a leading diversified industrial manufacturer of high precision metal and plastic components and assemblies. We combine advanced engineering and production capabilities with in-depth materials science expertise to design and manufacture high-precision components and assemblies for a variety of markets on a global basis. Headquartered in Charlotte, North Carolina, NN employs more than 3,300 employees in North America, South America, Eastern Europe, Western Europe, and Asia, who proudly serve customers around the globe with high quality precision solutions.





**Warren Veltman**

President and Chief Executive Officer

Our **mission** is to provide high-quality products and superior customer service that continuously exceed our customers' expectations while providing enhanced value for our stakeholders.

Our **vision** is to be the leading manufacturer of high precision components.



# Corporate Profile

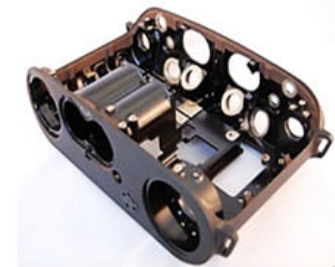
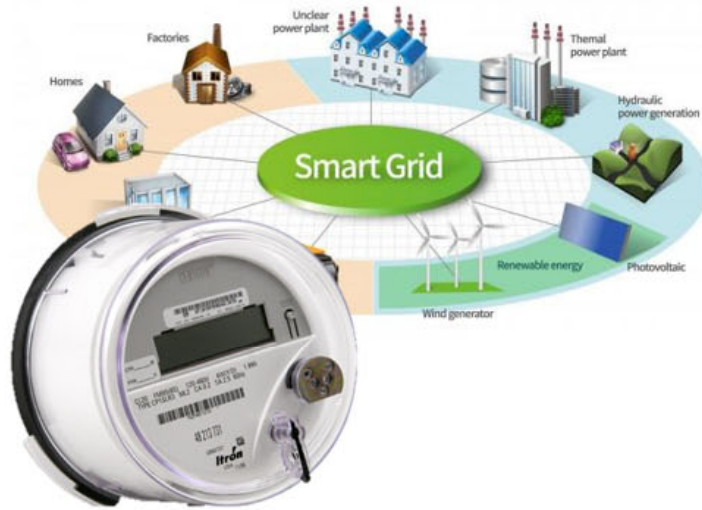
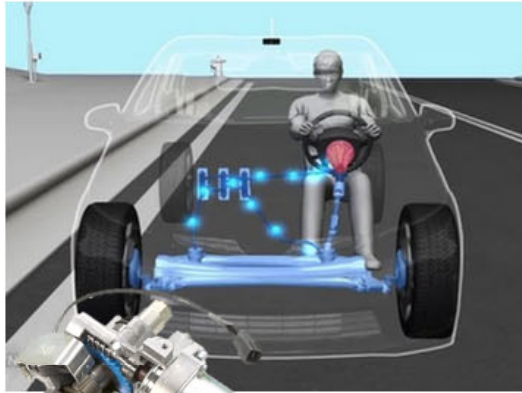
- NN, Inc. is a leading diversified industrial manufacturer
- Traded on NASDAQ (NNBR)
- 3,500+ employees in 30 facilities across North America, South America, Europe and China
- 2025 Target revenue of \$600M
- Combines materials science expertise and advanced engineering and production capabilities to provide high-precision metal and plastic components and assemblies to a variety of markets globally
- Our innovative manufacturing technologies, continuous improvement systems and experienced teams deliver high-quality, cost-effective solutions



**Leading supplier of high-performance OEM end-to-end solutions**



# Critical Components to Complete Product Solutions



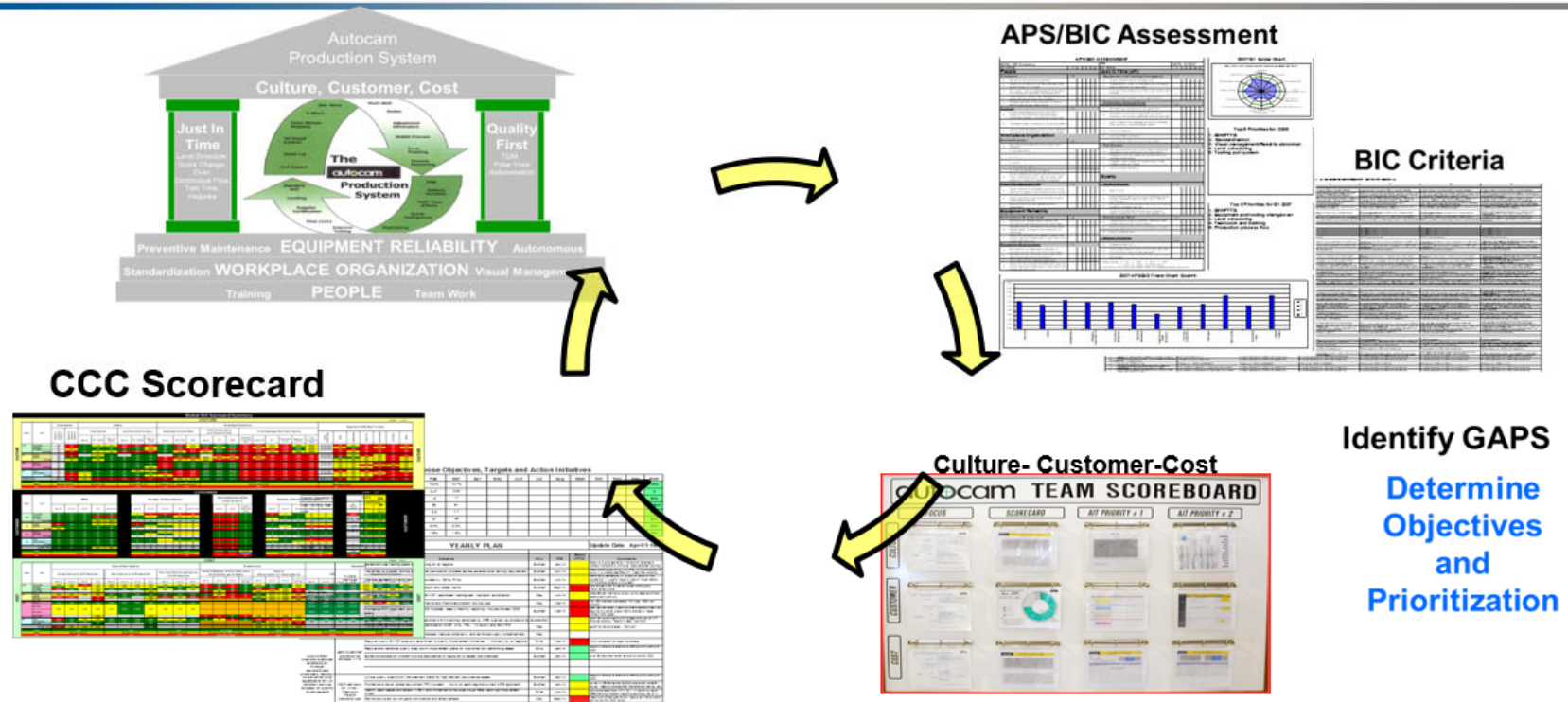


# What We Do





# Culture Focus

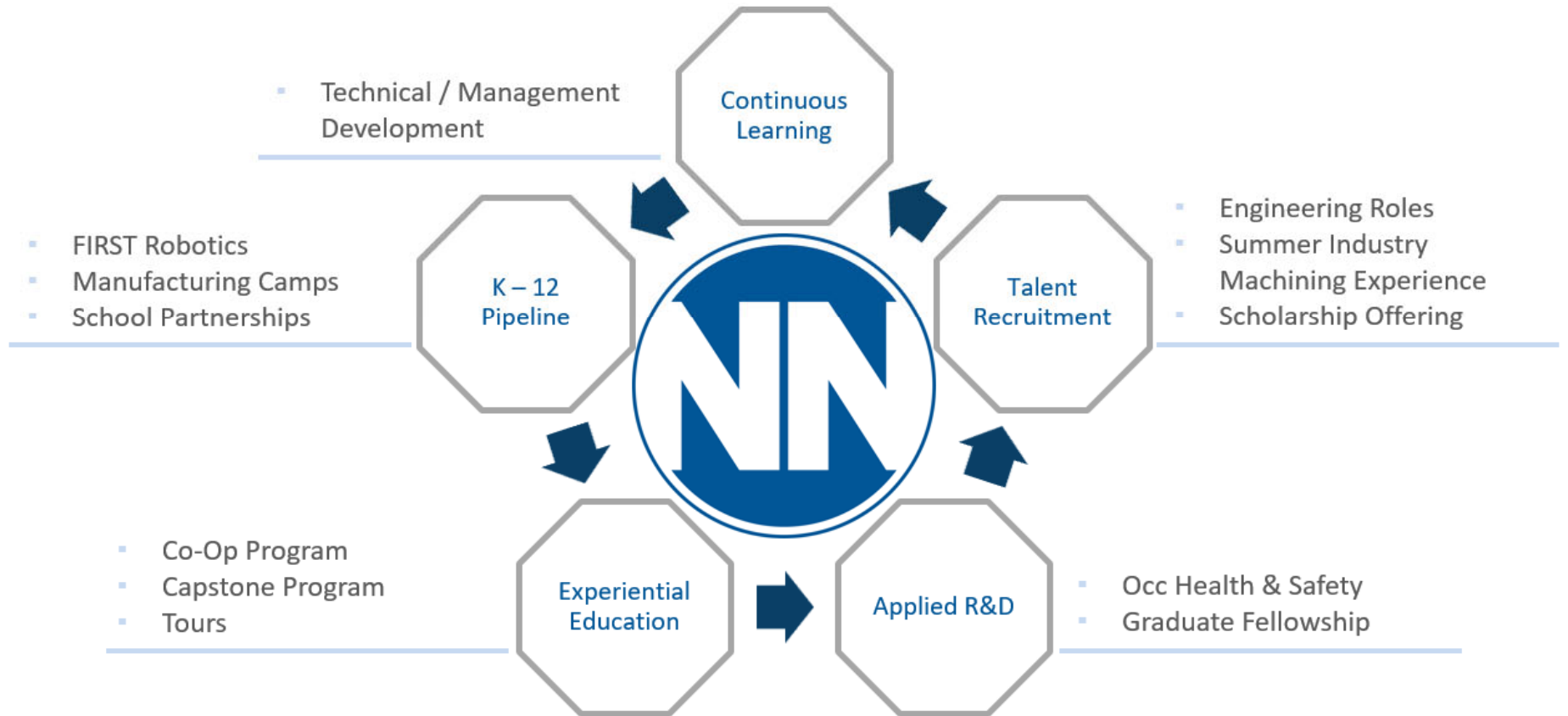


- Emphasizes **culture, customer, and cost**
- Continuous Improvement: Area Improvement Teams
- Scoreboards located throughout the facilities to track progress





# GVSU and NN Partnership







# GVSU and NN Partnership



- FIRST Robotics
  - High Schools
  - GVSU Regional Event Sponsor
- Manufacturing Camps
- MiCareerQuest & Manufacturing Day
- High School Partnerships
  - Advisory Boards
  - Mentorship
  - Guest Speakers
  - Resume/Interview Prep

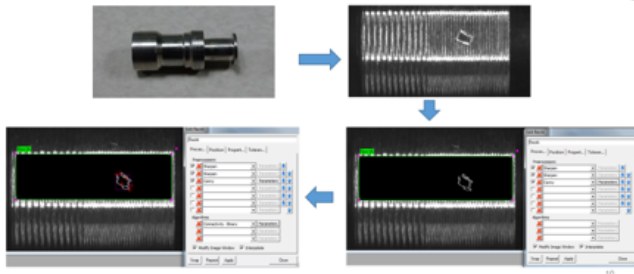




# GVSU and NN Partnership



## Stages of Defects Detection



- Industry Sponsored Graduate Fellowship
  - Masters Level research talent
  - Backburner project(s)
- Occupational Health & Safety Partnership
  - Fit & Breathability testing for N95 prototype
  - Design / material alternatives
  - Material Sourcing recommendations





# GVSU and NN Partnership



- Graduate Education
  - Masters in Business Administration
- Summit's & Support
  - The Right Place Manufacturing Leadership Summit
  - Engineering & Design Conference
  - Van Andel Global Trade Center
  - Commencement Speeches





# GVSU and NN Partnership



- Summer Industry Machining Experience
  - Prior to co-op approval
  - Industry relevant skill

- Co-Op Program
  - Rotational engineering development
  - Foundational Machining Experience
  - Product / Process / Quality responsibility

- Computer Science Engineering Capstone

- SAE Formula One Team
  - Talent Tours
  - Team build sponsorship

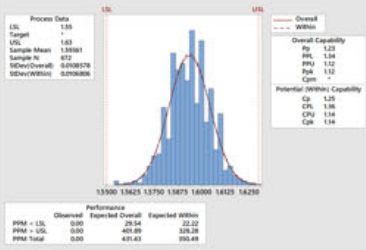
- GVSU Career Center Support
  - Speed Interviews
  - Co-Op Presentations
  - Student referrals

- HBCU Support
  - Regional welcome

- Scholarship Program
  - ½ Tuition Scholarship



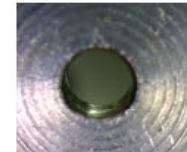
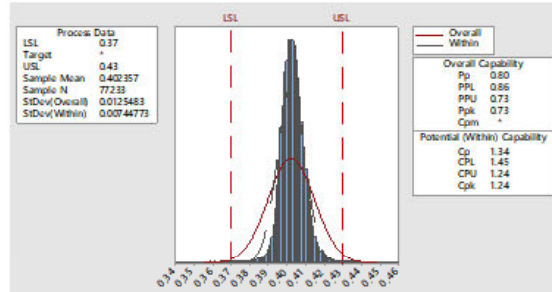
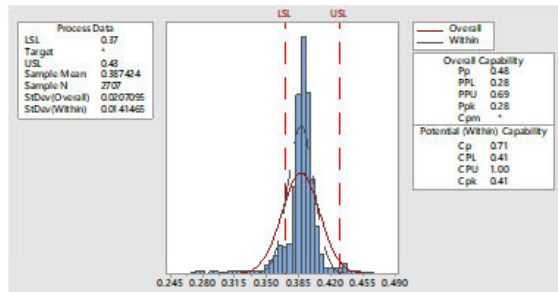
Process Capability Report for Counterbore Depth





# Co-Op Experience – Overview

## 3 Experiences



### Core Training Completed:

- R2A  
  ACAM 102  
  SPC  
  AIT  
  TPS

### Equipment Ran on the Floor / (Pay for Skills) On-Line Training Completed:

- Tornos  
  CNC  
  Hydromat  
  CX  
  Abrasives  
  Metal Cutting  
  Six Sigma

### Core Engineering Experiences Obtained:

<input type="checkbox"/> Manual Machining	<input type="checkbox"/> 1st Piece Approval Process	<input type="checkbox"/> Can Run our Core Equipment	<input type="checkbox"/> Gage R & R Study
<input type="checkbox"/> Process Mapping	<input type="checkbox"/> Tool Tryout Study	<input type="checkbox"/> Deburring Study	<input type="checkbox"/> Value Stream Mapping
<input type="checkbox"/> APQP	<input type="checkbox"/> Machinability by Heat Lot	<input type="checkbox"/> Quote Part Cycle Time	<input type="checkbox"/> Heat Treat Growth Study
<input type="checkbox"/> PPAP	<input type="checkbox"/> Capability Study	<input type="checkbox"/> Datalyzer	<input type="checkbox"/> PFMEA
<input type="checkbox"/> Minitab	<input type="checkbox"/> DOE Study	<input type="checkbox"/> Layout of Complete Job Setup on Paper	



# Co-Op Experience – 1<sup>st</sup> Rotation

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# Co-op Experience – 2<sup>nd</sup> Rotation

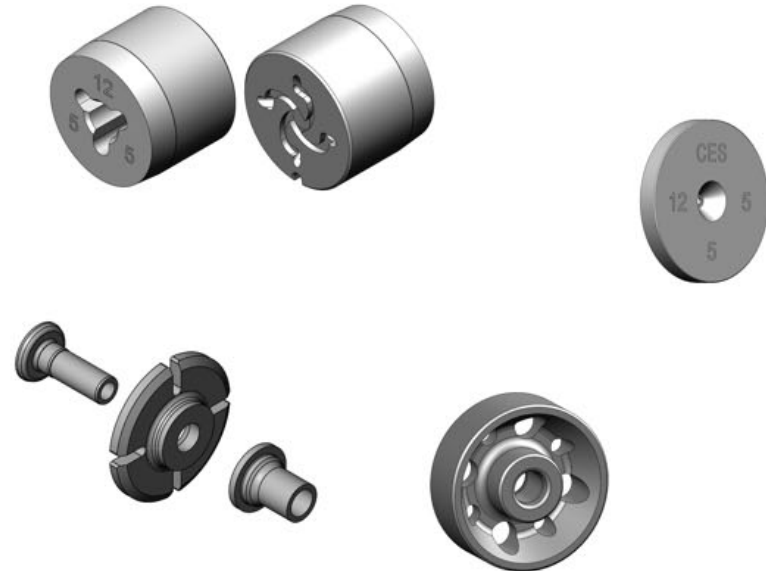
- Dimensional Inspection Machine
  - Machine runoff
  - Communication with the machine builders
  - Correlation studies
  - Gauge R&Rs
  - Creation of work instructions
  - Workflow design
  - Training leader





# Co-op Experience – 3<sup>rd</sup> Rotation

- Acquired valuable experience through the product launch process
  - CES Valve Seat 2.2
    - 6 Variations
  - CES Nozzle
    - 8 Variations
  - 3 Piece Armature
  - AIM Armature





## 2 Questions:

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1. What do you know now, that you wished you knew about NN Autocam before you started?

I wished I knew more about what Autocam did before I started working here. I had to work here for a while to more fully understand what we do. When touring the facilities early on, everything looked complex, but it seemed like a normal manufacturing facility to me. Autocam processes are very complex, and it takes a lot of skill and experience of employees to accomplish the advanced manufacturing processes that we do. Very few companies can compete with Autocam because of our competency and precision manufacturing capabilities.





## 2 Questions:

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2. What aspects have you liked, and what aspects have you loathed about working here?

I have enjoyed the people that I have worked with. Everyone is kind and helpful, and willing to have a little fun at work (rag balls, name that tune, etc.). Some tasks get repetitive, such as work instructions or capability studies, but these tasks are critical to ensure our manufacturing processes are successful.



# AMERICAN SOCIETY OF ENGINEERING EDUCATION

CEED Division: A Value Proposition

## CEED DIVISION

- This division strives to develop high principles and maintain the integrity of cooperative education throughout academia and industry. The general goals of the division are to foster a better understanding of cooperative education, improving co-op services to employers, and promote cooperative education in engineering and engineering technology to business and industry both national and international. The division also emphasizes professional standards and accreditation of co-op programs.
- **Expanded Vision: Broader definition of experiential education:**
  - Service Learning
  - Project Based Learning
  - Capstone Projects
  - Cooperative Education
  - Internships
  - Apprenticeships





# CIEC CONFERENCE

CONFERENCE FOR INDUSTRY & EDUCATION COLLABORATION



- A gathering of ASEE Divisions with Industry Connections:
  - College-Industry Partnership Division (CIPD)
  - Continuing Professional Development Division
  - Cooperative and Experiential Education Division
  - Engineering Technology Division

# ASEE CONFERENCE

Distinguished Lecturers

Panelists

Technical Sessions



## ACTION ITEMS

- Join ASEE & the CEED division
- Follow our LinkedIn page
  - Town hall topic updates
  - Best Practice Highlights
- Join us for the CIEC Conference







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COLLEGE OF ENGINEERING  
AND COMPUTING

Co-op Employer Forum  
Questions?

The logo features a stylized 'M' composed of two overlapping shapes: a red triangle pointing right and a yellow triangle pointing left, both with a white diagonal line. To the right of the 'M' is the text 'MANUFACTURING LEADERSHIP SUMMIT' in a bold, orange, sans-serif font.

# MANUFACTURING LEADERSHIP SUMMIT

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ADVANCED STRATEGIES FOR ADVANCED MANUFACTURING

**September 23, 2021**

8:00 AM – 4:30 PM

Grand Valley State University

Eberhard Center

Grand Rapids, Michigan

<https://www.rightplace.org/events/manufacturing-leadership-summit-2021>







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AND COMPUTING

# Co-op Employer Forum

## 2021 Annual Co-op Awards





**Abigail Hendrick**

Co-op Student-of-the-Year

2021 Computer Engineering Graduate

Gentex Corporation

Zeeland, MI



**Sanjivan Manoharan, Ph.D.**

Co-op Faculty Advisor-of-the-Year

Mechanical Engineering, Assistant Professor, School of Engineering, Padnos College of Engineering & Computing

Grand Valley State University



**Andy DeRosia**

Co-op Supervisor-of-the-Year

Test Engineering Manager

L3Harris Avionics Systems

Grand Rapids, MI



**DornerWorks**

Co-op Employer-of-the-Year

Kentwood, MI



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**Co-op Employer Forum**  
**Thank you for your continued support!**