

# Narsi Reddy Sanikommu

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## EDUCATION

### Master of Science - Mechanical Engineering

JOHNS HOPKINS UNIVERSITY

Aug 2024 - May 2026

Baltimore, MD

### Bachelor of Technology - Mechanical Engineering

National Institute of Technology (NIT Trichy)

July 2016- May 2020

Tiruchirappalli, India

## EXPERIENCE

### Becton, Dickinson, And Company

Mechanical Engineering Co-op Intern

July 2025 - January 2026

Sparks, MD, USA

- Designed and validated an analog replacement fixture for the **BD COR GX shuttle** to characterize tube puncture force and clamp-pin material force profiles; developed a spring-based mechanism that replicates puncture-force behavior for **20k cycles**, significantly improving test efficiency versus the prior few hundred cycle tube-replacement-intensive setup.
- Conducted detailed characterization of the **BD COR MX liquid-waste sensor** by developing a 3D contour map of sensor activation as a function of liquid volume, sensor Z-height, and X-offset from the collector; enabled prediction of sensor trigger volume with **95%** accuracy to inform physical design decisions.
- Performed feasibility study and design iteration of the **BD COR PX load cell** using SolidWorks, including leak testing and final design validation; the proposed design enables real-time measurement of sample, diluent, and reagent weights, reducing sample waste, improving error detection, and enhancing troubleshooting capability.
- Executed root-cause analysis (**RCA**) on the **BD COR MX extractor** magnetic-strength characterization fixture; implemented minimal design changes to eliminate fixture warping by adding a snap-fit support feature that consolidates PCB loading forces into the metal holder.

### Soft, autonomous microneedle rolls for oral drug delivery, Dr Gracias Lab

Oct 2024 - November 2025

Baltimore, MD

Research Assistant

- Designed and fabricated soft, autonomous microneedle roll devices using **photolithography & soft lithography** for targeted drug delivery in the GI tract to treat autoimmune disorders like **Crohn's disease and ulcerative colitis**.
- Optimized fabrication of drug-embedded gelatin microneedles (0.3 mm diameter) using soft lithography with sequential heating and centrifugation cycles, reducing process time from **2 hours to 2 min** and improving mold-release yield from **40% to 80%**.

### Becton, Dickinson, And Company

July 2020 - Aug 2023

Bangalore, India

Design Engineer 2, Design Engineer 1, GET

- Led multiple PE projects involving material change by updating **SolidWorks** drawings per **GD&T** standards, planned and executed DV activities, analyzed data with **Minitab**, DV Protocols & report release, DV Reviews, and ECRO process through **Teamcenter PLM** and **SAP**. Completed projects 2 weeks ahead of schedule, avoided back-orders and operation delays.
- Coordinated **Test Method updates** by designing a new test fixture and performed **MSA** and **FEA** simulations to replicate fixture engagement with components. Updated and leveraged existing MSA, reducing DV tests by **5x** and saving **2 weeks** of testing time.
- Updated and validated **112 BOMs in SAP**, coordinating with plant stakeholders to avoid duplicate work; detected **5 BOM errors** early, preventing **3 weeks** of potential rework.
- Led **RCA** of high-pressure leak-test failures in **BD Alaris pump sets**; implemented fixture and work-instruction updates that eliminated re-testing, preserved **100%** of DV test data, and avoided an estimated **\$20K** in retest costs and schedule delays.
- Innovatively leveraged existing BD PIVC platform components to create a new HDS product prototype in **1 week at a cost of \$100**; led internal VoCs and validation activities, proposing a commercialization strategy that projected **6 months reduction in NPD timelines** and substantial regulatory and testing cost savings by utilizing pre-existing FDA-cleared data.
- Submitted **68 Invention Disclosure records**, with **14 IDR** filed as **US patents**, and some are in pipeline.

## NOTABLE PROJECTS

### Segmented Fluidics Flow for Soft-body actuation, & Self folding shell microfluidics | Baltimore, MD Sep 2025 - Present

- Explored segmented fluidic-flow actuation in soft-bodied systems by developing a single-channel hydrogel "noodle" actuator; implemented segment-wise expansion control using timed fluid delivery and dehydration cycles to achieve flexible robot motion.
- Investigated a multimodal, single-channel microfluidic platform to route drugs and nutrients to multiple target sites; applied the approach to self-folding shell organoids and developed low-cost, reusable SLA-printed prototypes for rapid manufacturing.

## SKILLS

### Programming Languages

Python | C++ | C

### Software

Microsoft Projects | Minitab | Arduino IDE | MATLAB | Processing code | ROS2 | CorelDRAW | KiCAD | CAD modeling SolidWorks, CATIA, ANSYS, Abaqus, Creo, AutoCAD, NX CAD) | Teamcenter PLM | NumPy

### Technical Skills

GD&T | SAP (ECRO, ECM, BOM, PO) | 3D Printing and rapid prototyping (FDM and SLA) | RCA | CAPA | Product Innovation | Product development | Design Controls(User needs, System Requirements, DIDO, V&V, DVDR, and Engineering change) | MSA | DFSS | DFMA | Photolithography | softlithography | Microfluidic device design | MEMS Device Fabrication | TEM | SEM

## NOTABLE PUBLICATIONS

Stable flow regulator assembly: US20240175499A1 (Application granted)

Fluid connector system: US12186518B2 (Application granted)

Comprehensive list and details of the patents: [\(Google Scholar\)](#)