JOHN PAUL

Mechatronics Engineer
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SUMMARY

Mechatronics and Robotics Engineer with 5+ years of experience developing advanced robotic systems, humanoid hardware, and intelligent electromechanical platforms. Specialized in robotic hands, manipulation, perception-guided grasping, and embedded control. Experienced in end-to-end product development—from concept and rapid prototyping to system integration, testing, and real-world deployment—bridging mechanical, electronic, and intelligent control systems to deliver scalable robotics solutions.

■ PROFESSIONAL EXPERIENCE

Humanoid Development Engineer *Aug 2024 – Present*
Neura Robotics — Metzingen, Germany

- Designed and developed a 5-finger dexterous linkage driven robotic hand for the 4NE-1 humanoid robot, delivering complete mechanical architecture, actuation design, prototyping, and system integration to enable advanced robotic manipulation; completed 3 prototype iterations in 2 months, achieving 90 N gripping force while maintaining hardware cost under €2,000.
- Implemented vision-based tactile sensing to the hand by integrating a palm camera and tactile sensors to support machine-learning–based real-time grasp planning; improving grasp adaptability by ~30% across 6+ object types compared to a baseline hand without visual feedback.
- Engineered a 6-DOF underactuated tendon-driven robotic hand using Dyneema tendon transmission and 6 actuators, optimizing tendon routing and joint architecture to improve structural sturdiness while minimizing mechanical and actuation complexity.
- Performed calibration, integration, and commissioning of humanoid robotic subsystems, validating 20+ actuators, sensors, and ran endurance tests to ensure reliable system performance.
- Prototyped and implemented a 2-DOF humanoid neck mechanism (yaw–pitch) using servo motors, enabling stable camera alignment for vision-based object tracking.

Mechatronics Engineer – Robotics Solutions Intern *Feb 2024 – Aug 2024*
Neura Robotics — Metzingen, Germany

- Designed an 11-DOF tendon driven humanoid robotic hand as part of my master's thesis, implementing mechanical architecture, joint design, and kinematic modeling using Creo Parametric.
- Developed a configurable TeachMate interface for LARA and MAiRA cobots, enabling 4-channel digital input programming via the robot flange and reducing robot teaching time during system setup.
- Built a 22-DOF humanoid hand prototype using DexHand principles, integrating MediaPipe-based gesture tracking via a wrist-mounted camera and Raspberry Pi 5 to mimic human hand gestures for standalone robotic manipulation demos.
- Prototyped a automated box feeder system for robotic palletization, enabling fully automated demonstration workflows by providing continuous box feeding to the robot

Robotics QA & End-of-Line Testing Engineer (Working Student) *Oct 2023 – Feb 2024*
Neura Robotics — Metzingen, Germany

- Conducted quality assurance and end-of-line testing for 30+ cognitive robots, validating AI applications, hardware components, and overall system performance to ensure deployment readiness.
- Implemented standardized test setups for cognitive robots, improving validation repeatability and reducing testing time by ~1 hour per robot.

Assembly & Calibration Technician (Working Student) *Aug 2022 – Sep 2023*
NavVis GmbH — Munich, Germany

- Assembled, calibrated, and tested LiDAR-based mobile mapping systems, ensuring precision sensor alignment and operational reliability.
- Performed hardware diagnostics and evaluation, supporting quality assurance of high-precision mapping devices.

Marine IoT Implementation Engineer *Nov 2019 – Nov 2021*
Navidium India Pvt. Ltd. — Kochi, India

- Implemented IoT-based monitoring systems on 3 commercial vessels, enabling real-time tracking of ship performance parameters for operational analytics and remote monitoring.
- Analysed vessel architectures and operational datasets to design optimized multi-sensor and PLC hardware layouts for smart ship automation.

Automotive Engineering Intern *Jul 2018*
Mercedes-Benz — India

- Diagnosed and resolved vehicle mechanical and engine system faults using OBD diagnostic tools, supporting automotive maintenance and engineering troubleshooting workflows.
- Carried out post-service vehicle testing and validation, verifying operational safety and vehicle system performance before release.

Electronics Engineering Intern *Jul 2016*
KELTRON — India

- Developed embedded electronics prototypes using Arduino, implementing hardware interfacing, microcontroller programming, and sensor integration.
- Supported prototype testing and debugging, gaining experience in embedded system design and electronic circuit development.

■ EDUCATION

M.Sc. Mechatronics and Cyber-Physical Systems *2021 – 2025*
Deggendorf Institute of Technology — Germany

B.Tech Electronics and Communication Engineering *2015 – 2019*
Rajagiri School of Engineering and Technology — India

■ TECHNICAL SKILLS

Mechanical & Mechatronics:	3D Printing • Actuator Integration • CAD Design • Hardware Validation • Mechanism Design • Rapid Prototyping
Robotics & Manipulation:	Dexterous Manipulation • Hardware Debugging • Humanoid Robotics • Robot Calibration • Robot Testing • Robotic Hands • Robotic System Integration • Tendon-Driven Mechanisms • Underactuated Systems • Vision-Assisted Grasping
Programming & Embedded:	Arduino • C++ • Embedded Systems • Python • Raspberry Pi
Design Tools:	Blender • Creo Parametric • SolidWorks

■ PROJECTS (Video Demonstrations in Portfolio)

Vision-Based Robotic Hand with Tactile Sensors and Real-Time Grasp Planning
Developed a robotic hand with an integrated palm camera, tactile sensors, and force-feedback control for adaptive grasping. Designed a control GUI and implemented an ML-based object recognition system using the onboard camera to enable real-time grasp planning.

22-DOF Humanoid Hand with Gesture Mimicking
Engineered a 22-DOF tendon-driven humanoid hand capable of real-time human gesture mimicry. Built a standalone system powered by a Raspberry Pi with a wrist camera for visual feedback and control.

11-DOF Humanoid Robotic Hand (Master's Thesis at NEURA Robotics)
Designed and prototyped a fully articulated 11-DOF robotic hand for a humanoid robot, actuated using linear actuators implanted in palm and engineered using Creo Parametric.

Myoelectric Bionic Arm (Bachelor's Thesis)
Prototyped a 3D-printed EMG-controlled prosthetic arm, enabling voluntary muscle-based control for lower-arm amputees while reducing cost by ~70% compared to commercially available prosthetic hands.

Multi-Terrain Mobile Robot with Manipulator
Built a 4-wheel robotic platform capable of climbing 80° inclined ramps, using a custom manipulator for traction assistance.

Autonomous Maze-Solving Robot
Developed an autonomous robot capable of navigating complex mazes using onboard sensors and control algorithms.

Magnetorheological VR Haptic Shoes
Proposed VR haptic footwear using magnetorheological fluids to simulate terrain sensations in virtual environments.

■ AWARDS

- 1st Place — AlpineBot Competition conducted by RoboRave International
- 1st Place — MazelBot, National Level Robotics Competition
- Best Bachelor's Project Award — Rajagiri University
- All-Rounder Student Award of batch 2015