# Paolo Miguel P. Naty

Mechanical Design Engineer

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DESIGN PORTFOLIO

## Summary


Mechanical Engineer with over 4 years of experience in mechanical and machine design, specializing in product development and prototyping from concept through production. Proficient in developing design concepts, engineering solutions, 3D modeling, technical drawings, and detailed reports. Hands-on experience with additive manufacturing technologies, complemented by skills in electrical/harness design and programming using Python and C#.

Demonstrated leadership in mentoring junior engineers and coordinating cross-functional teams to deliver complex projects on time while maintaining high quality standards. Adaptable to fast-paced and remote work environments, with strong collaboration skills to align technical solutions with project goals.


## Work Experience

**3D Printing Consultant & Model Designer** *(Freelance)*
*Blue Sky Building Company LLC, Waynesville, NC (Remote)*
*Dec 2024 - Present*

- Design FDM 3D-printable solutions to improve client inventory organization and address other specific needs.
- Modify, recreate, and optimize existing 3D models based on client requirements and sketches.
- Provide consultation on FDM 3D printing workflows, diagnose issues, and offer solutions to improve print quality and reduce failures.

**3D Printing Technician & Model Designer** *(Freelance)*
*Dojo Arts PH, Imus, Cavite (Hybrid)*
*Sep 2024 - Present*

- Design and fabricate mold shells, silicone rubber molds, master models, and jigs for toy manufacturing.
- Operate FDM and SLA 3D printers, and prepare rubber silicone and epoxy resin mixtures for production.
- Extract, post-process, finish, and ship 3D printed and cast products.
- Handle and complete small technical print and design orders received through direct client inquiries.

**Research Assistant - Prototype and VR Developer** *(Contract)*
*Evelyn D. Ang - Inst. of Biomedical Engineering & Health Technologies, Biñan, Laguna (Hybrid)*
*Apr 1, 2025 - May 31, 2025*

**Project: "***SIGLA: Depression Recognition and Analysis from EEG towards Virtual Reality-based Therapy Program*"

- Took charge of the final design, development, and fabrication of a prototype device structure, delivering a fully assembled unit in under two weeks.
- Improved testing and development efficiency using a modular component design and rapid 3D modeling in Blender.
- Operated multiple FDM 3D printers with optimized scheduling, proper material selection, and effective usage of multicolor operations to achieve full utilization and uninterrupted production.
- Assisted the lead VR developer in the creation and revision of OOP Python and C# scripts for a Unity VR project, using GitHub for version control and collaboration.

**Design Engineer** *(Fulltime)*
*Suminac Philippines Inc., Dasmariñas, Cavite (Hybrid)*
*Feb 16, 2021 – May 3, 2024*

- **Sub Team Leader: Emerging Technology**
  *Jan 2023 - May 3, 2024*
  - Managed and coordinated the Filipino engineering team in the design work of a prototype autonomous forklift, ensuring alignment and efficient collaboration with the Japanese parent team.
  - Developed a unified master 3D assembly model for common use of the team, coordinated task distribution to maintain workflow efficiency, and ensured up-to-date design information and data management across teams.
  - Created documentations that improve team output quality, overall performance, and on-time task delivery.
  - Assisted the design leader for team management, work load distribution and training of junior engineers.
  - Ensured the completion of urgent and difficult tasks by proposing plans and coordinating with top management.
  - Continuously performed the duties and responsibilities of a design engineer.
- **Design Engineer Dispatch to Japan**
  *Apr 2023 - Jun 2023*
  - Collaborated directly with Japanese engineers in designing and developing a prototype autonomous forklift, focusing on LiDAR layout, enclosure design, signal lighting, and overall design revisions.
  - Created detailed component design documents to record technical considerations, support design discussions, and drive iterative improvements with the Japanese team.
  - Acted as the primary liaison between Japanese and Filipino engineering teams, ensuring smooth task execution and enhanced cross-functional collaboration.
- **Design Engineer: Emerging Technology**
  *Jan 2022 - Jan 2023*
  - Designed new forklift components focused on sensor integration for vehicle autonomy and telemetry using Creo PTC and NX Siemens, handling the full design lifecycle including conceptualization, layout, modeling, drafting, documentation, and design data management.
  - Carried out design work for brackets, covers, sheet metal, welded, and machined components, wire harnesses, and modification of existing parts to integrate sensors according to task specifications.
  - Practiced reverse engineering, advanced parametric & rapid prototype modelling, GD&T analysis, simple static NX FEA, reading electrical schematic & wiring diagrams, creating assembly guides, BOM creation, and processing ECNs.
- **Design Engineer: Electrical Development**
  *Feb 16, 2021 - Jan 2022*
  - Designed new forklift wire harnesses and electrical components using Creo PTC, handling the full design lifecycle including conceptualization, layout, modeling, drafting, documentation, and design data management.
  - Carried out design work for wire harnesses by proper selection of wire size, color, protective tubing, terminals and connectors while considering connection points, routing, accessibility and fixing points.
  - Practiced reading electrical schematic and wiring diagrams, BOM creation and processing ECNs.

**Mechanical Design/Machinist** *(Internship)*
*De La Salle University – Dasmariñas, Dasmariñas, Cavite*
*Jun 2018 - Aug 2018*

**Project: "***Agimat V2.0: a three-wheeled prototype vehicle running on a lithium-ion battery"*

- Redesigned and layout of the frontal structure, which includes: steering, front suspension, wheels, brakes, structural weight reduction, overall assembly, and other minor components using SolidWorks.
- Operated CNC mills as well as manual milling machines and lathes for aluminum parts fabrication.

## Technical Projects

**Compact DIY 3D Printer *"Mirage"***

*Jun 2024 - Present*

- A compact DIY 3D printer built for versatility, portability, and performance. Personally assembled and customized, the fast print speeds and setup times make it an excellent backup printer for small parts, and ideal for on-the-go demos and presentations.
- Gained practical expertise in FDM 3D printing systems and workflows, open-source Klipper firmware, G-code scripting, embedded control, and mechanical and electric systems integration.

**Neurotech Project *"SIGLA"***

*Apr 1, 2025 - May 31, 2025*

- A neurotech project under EDA-IBEHT in collaboration with DOST-PCHRD. Utilizes EEG and virtual reality technologies to support depression therapy by analyzing EEG signals within an immersive virtual environment.
- Practiced rapid prototyping and modular design, Blender-based 3D modeling, and Unity VR development by assisting with Python and C# scripting using GitHub for version control and collaboration.

**Unpublished toolhead for 3D printer Kingroon KP3S 3.0**

*Oct 2024*

- A retrofitted toolhead into the commercial 3D printer by Kingroon KP3S 3.0. It offers improved part cooling, enabling faster print speeds, automatic bed leveling and the ability to print non-exotic, high temperature materials (ABS and ASA) compared to stock toolhead.
- Developed a foundational understanding of design limitations and key considerations in FDM 3D printing, as well as mechanical and electrical systems integration.

**Eco Car *"Hiraya"***

*Jun 2018 - Sept 2019*

- A four-wheeled prototype eco vehicle running on diesel engine. Represented DLSU-D in the Shell Eco-Marathon Asia 2019 in Sepang, Malaysia under the "Urban Concept - ICE" category
- Designed and layout of the entire vehicle but mainly focused on the frame, chassis, steering mechanism and covers.

**Eco Car *"Agimat V2.0"***

*Sep 2017 - Mar 2018*

- A three-wheeled prototype eco vehicle running on a lithium-ion battery Represented DLSU-D in the Shell Eco-Marathon Asia 2018 in Changi, Singapore under the "Prototype - Battery Electric" category
- Redesigned and layout of the frontal structure, which includes: steering, front suspension, wheels, brakes, structural weight reduction, overall assembly, and other minor components.

## Technical Skills

**Mechanical, Machine Design and Product Development**

- Design data management (PDM & version control)
- Rapid prototyping and iterative development
- Design for manufacturing and assembly (DFMA)
- Geometric dimensioning and tolerancing (GD&T), technical drawings & BOM creation
- Basic finite element analysis (FEA) using NX & SolidWorks
- Sheet metal, welding, part machining and additive manufacturing
- Basic epoxy resin and silicon mold design

**CAD and 3D Modelling**

- Parametric and synchronous/direct modelling, assemblies, layouts, and drafting (Creo PTC, NX Siemens & SolidWorks)
- Sheet metal, wire harness and cabling, surfacing and part families (Creo PTC, NX Siemens & SolidWorks)
- Mesh modelling and basic sculpting for prototyping and visualization (Blender)

**Additive Manufacturing and 3D Printing**

- Advance FDM 3D printing operations: optimization, troubleshooting, multi-color/multi-material
- Basic SLA 3D printing operation
- Design for additive manufacturing
- Multi-printer management, print scheduling, and process optimization
- Proficiency with 3D printing slicers and Klipper firmware
- Comprehensive understanding of FDM 3D printer systems gained through DIY assembly and configuration

**Cross-Disciplinary**

- G-code scripting for 3D printers and CNC machines
- Technical documentation: instruction manuals, assembly guides and technical illustrations
- Basic electrical/harness design: wire sizing, routing, connectors, etc.
- Basic scripting: Python, C#, VBA (Excel automation and Unity-based projects)
- Basic knowledge of OOP programming
- GitHub-based collaboration and version control

## Education

2014 - 2019 **BS in Mechanical Engineering -** De La Salle University -Dasmariñas, Philippines

2009 - 2014 **High School Diploma -** Imus Institute, Philippines

## Trainings and Seminars Attended

Mar 14, 2024 **Stress Management and Promoting Wellbeing**
Suminac Philippines Inc., Dasmariñas, Cavite

Jul 13, 2023 **Design Management Training**
Suminac Philippines Inc., Dasmariñas, Cavite

Apr - Jun 2023 **Sumitomo NACCO Design Engineer Special Training Assignment**
Sumitomo NACCO Forklift Co. Ltd., Obu-shi, Aichi-ken, Japan

Jun 4, 2019 **Communication in the Workplace Program**
Language Learning Center, De La Salle University–Dasmariñas

## Awards and Achievements

Dec 23, 2022 **Quality Award as a Design Engineer**
Suminac Philippines Inc.

Feb 2020 **6th Placer Mechanical Engineer Licensure Examination**

May 2019 **Exemplary Academic Performance as a BSME Student**
12th Annual CEAT Recognition, De La Salle University–Dasmariñas

May 2017 **Exemplary Academic Performance as a BSME Student**
10th Annual CEAT Recognition, De La Salle University–Dasmariñas

## References

**Gladys Babiera** | Evelyn D. Ang - Inst. of Biomedical Engineering & Health Technologies | Project Technical Specialist IV
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**Mark Louie Quintab** | Suminac Philippines Inc. | Design Development Leader
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**Aljhon Pon-an** | De La Salle University-Dasmariñas | Laboratory Technician
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