María Carretero Soria

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Results-driven Mechanical Engineer with a strong background in medical device design, development and manufacturing. Skilled at leading multidisciplinary teams and developing innovative, user-centred, high-performance engineering solutions. Passionate about integrating mechanical engineering with healthcare innovation to develop transformative technologies. Thrives on tackling complex challenges and making a meaningful impact in the medical engineering field.

EDUCATION

Imperial College London, MEng Biomedical Engineering (Mechanical Engineering Pathway) **Oct. 2021- June 2025**

- Predicted 2:1
- Relevant modules: Manufacturing Technology and Management, Fluid and Solid Mechanics, Biomechanics, Orthopaedic Biomechanics, Design for Additive Manufacturing, Computational Stress Analysis, Physiological Fluid Mechanics, FEA and Applications, Tissue Engineering and Regenerative Medicine, Biomaterials.

British Council School Madrid, Bilingual Technological Baccalaureate **Sept. 2019- May 2021**

- 10/10

WORK EXPERIENCE

Mechanical Engineer Intern **Sept. 2024- Present**

Koalaa Soft Prosthetics

- Designed and prototyped a user-centred prosthetic terminal device, ensuring usability and safety compliance.
- Achieved a 34% weight reduction compared to market alternatives whilst improving durability and cost-efficiency.
- Conducted FEA simulations and physical testing, integrating generative design software for optimisation.
- Collaborated with stakeholders to ensure regulatory compliance and user accessibility.
- Developed a Product/User Requirement Specification and Risk Assessment Document, outlining design requirements and safety strategies.

Mechanical Engineer **Oct. 2022- Aug. 2024**

The Pace Centre

- Led a team of 10 to develop a cost-effective powered wheelchair simulator for children with cerebral palsy.
- Secured funding for prototype advancement, focusing on enhanced user experience and safety.
- Designed mechanical components, optimising for manufacturing efficiency using Design for Manufacturability principles.
- Delivered a comprehensive risk assessment and product specification document.

Mechanical Engineer Intern **Oct.2023 – June 2024**

Smart Surgical Solutions

- Led a cross-functional team of 6 to develop M.A.R.I.O (Mobile Assisted Reconstruction In Orthopaedics), a device that improves surgical accuracy and patient outcomes for TKA surgery.
- Designed and implemented new device features for high volume manufacture in Fusion 360, incorporating client feedback and integrating ISO safety regulations.
- Developed and iterated cost-efficient, high-precision prototypes.

Biomedical Engineer Intern at Laboratorio de Gestión 3D **July 2023 – Sept. 2023**

Hospital La Paz Madrid

- Designed patient-specific surgical cutting guides and medical training devices by segmenting CT scans in 3DSlicer and refining models in Meshmixer.
- Collaborated with surgeons to align designs with surgical needs and ISO 13485.

PROJECTS

Automated Manufacturing Solution for Aerospace Part Production **Jan. 2025- Present**

- Developed an ISO-compliant manufacturing process for aerospace-grade End Nuts.
- Created detailed production planning documents, including a Bill of Materials and cost analysis.
- Specified CNC machines, work holding, part-handling and cutter tooling solutions for optimal efficiency and accuracy.
- Programmed CAM operations, generating toolpaths, G-code and CNC setting sheets for production.
- Established metrology and quality control processes, integrating precision measurement techniques.
- Developed a factory model and finite capacity plan to enhance production efficiency, lead time reduction, and scalability.

Self-healing Bone Cement Using Squid Ring Teeth (SRT) Proteins **Oct. 2024- Nov. 2024**

- Sustainably designed a novel bone cement to improve total hip arthroplasty outcomes, reducing implant failure rates.

Orthotic Flip Flop **Jan. 2024- March 2024**

- Developed a manufacturable orthotic flip flop with advanced Design for Additive Manufacturing and Design for Manufacturability principles, addressing current market limitations.

Prosthetic Hand Structural Analysis **March 2024**

- Conducted FEA and fatigue life analysis and redesigned components to enhance structural integrity and lifespan whilst ensuring compliance with safety criteria and design requirements.

LEADERSHIP EXPERIENCE

Bioengineering Department Academic Representative **Oct. 2023 - Present**

- Advocated for student academic interests, implementing policy improvements with faculty.

Hall Senior at Beit Hall (Imperial College hall of residence) **Oct. 2022- Present**

- Ensured student welfare, managed events, budgets, and facilitated hall operations.

Prosthetics Society Cybathlon Foot Lead **Oct. 2023 – Present**

- Design and manufacture of a cost-effective foot prosthetic.

Judo Club President **Aug. 2022- Aug. 2023**

- First female and black belt president, increased female membership by 700% through targeted outreach and training initiatives.
- Led strategic planning, budget management, team coordination and advocacy.

Spanish Society Committee **Aug. 2022- Aug. 2023**

- Organised events, logistics, and community engagement, fostering an inclusive environment.

AWARDS AND CERTIFICATES

1st Prize for research in cardiac tissue engineering (200 student cohort) **Feb. 2024**

Certificate on medical applications for 3D printing from EDDM Engineering Education **Aug. 2023**

TECHNICAL SKILLS

Languages: Spanish (native language), English (C2/ native language), French (B2), German (A1)

Solidworks | Fusion360 |CAD | FEA | Technical drawings |CAM | CFD | Generative design | Python | Matlab | Excel | 3D printing | AutoCAD | Ansys | Marc Mentat |