

GIOVANNI MILANDRI, PhD (UCT), MSc (U. Oxford), MScEng (Stell. U.)

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An engaging R&D technical manager with seven years medical device industry experience and four years in battery electric vehicle design, with a significant product and publication portfolio. Technical project manager of multidisciplinary R&D in orthopaedics, robotics and prosthetics, leading teams and in collaborations. Has independently run a clinical randomised controlled trial (RCT) with 26 patients to ISO 14155:2011. QA/RA experience implementing ISO13485 QMS and ISO14971 risk analysis for several class I/IIa/IIb medical devices.

BIOMEDICAL RESEARCH & DEVELOPMENT

Project Manager/Research Associate, Imperial College London (Feb. 2020 – present).

- Self-initiated grant awards of £158k, including *Bone Protector Plug for Amputee Pain*, MedTech SuperConnector accelerator in partnership with GSK, design and development of an implant to improve patient function and mobility.
- Designed and patented a new global prosthetic knee as part of TaKeuP, a prosthetics project with partners in Cambodia, Switzerland, Tanzania, and UK. This project is being supported by Imperial College to form a spin-out company.
- Application of ISO13485, ISO14971 and IEC62366-1, as well additional product-specific applicable standards.
- External fixator for bone fractures for global surgery. Successful first-in-human use clinical trial in Sri Lanka in 17 patients, part of £2.2M post-conflict grant.

Technical Project Manager: Robotic Prosthetics, Rehab Tech, Italian Institute of Technology, Genoa, Italy (Sept. 2017 – Feb. 2020). €5.2M (3 years) project award, renewed Jan. 2020 for additional 3 years.

- Technology Project Manager of a team of nine engineers to develop two bionic prosthetic knees and a robotic prosthetic foot/ankle (patent application filed).
- ISO13485 QMS and ISO14971 risk management for Class I / II devices.
- Application of parts of IEC60601 and IEC62304.
- Laboratory testing tools: Labview® cRIO, Vicon, EMG, AMTI split belt treadmill.

Director/co-founder: Medev Innovations Ltd., (2017-present). Inventor and investor in MotusCPM post-surgical rehabilitation device. Patented mechanism based on soft robotics to eliminate patient discomfort during home rehabilitation. <https://youtu.be/dQ8XNkaFWQs>

Accelerator Manager, Medical Research Council (MRC) South Africa (Jan. 2012 – Dec. 2013). Medical Device Innovation Platform,

- Actively steered 13 selected university translational projects towards clinical use and investor readiness.

Orthopaedic Surgical Tools Design Engineer (Jun. 2008 – Jan. 2010, part time) for Dr Ian Dymond, orthopaedic surgeon internationally recognised for developing minimally invasive hip surgery (MIS) products and techniques.

- Designed a sterile orthopaedic surgical retractor with significantly improved patient safety, improved surgeon control, and reduced surgical time and cost.
- Successful exit sale of 10% share in 2011 valued the product at approx. €70k.
- Current case history of over 3800 hip replacements, and still growing in use as of 2022.
- Improved patient safety by designing patented novel retractor mechanism to resolve a key problem of femoral neck damage caused by previous tool.

Battery Electric Vehicle (BEV) Design Engineer, (Apr. 2006 – Aug. 2010): Optimal Energy, Ltd, South Africa.

- Design, technical documentation, build and validation of ultra-lightweight composite chassis (~80kg) and suspension automotive subsystems. Manager of full-vehicle 3D CAD baselines (>10k parts) and electronics/hardware integration, for the *Joule* Battery EV.
- Technical evaluator of body/interior designs for 3 years under Keith Helfet, Design Director and critically acclaimed Chief Designer of Jaguar Cars, Inc., UK.
- Generated and managed €50M of technical RFQ/Ps with international suppliers EDAG GmbH (DE), Magna Steyr (Austria) and Bosch GmbH (DE), and compiled into the vehicle's 3-year bankable Product Development strategy and plan.

EDUCATION

PhD, Biomedical Engineering, University of Cape Town, South Africa (Dec. 2013 – Jul. 2017).

- PhD Grant Award (£98 000 equiv.) National Health Scholars Programme (Health Technology) given by the South African Minister of Health, Dr Aaron Motsoaledi.
- **Clinical trial 1:** randomised controlled trial (RCT) intervention with 26 ACL-Reconstructed patients, eccentric training group v. concentric training group. To ISO 14155:2011.
- **Clinical trial 2:** biomechanical cross-section trial, 15 ACL-Reconstructed patients v. 15 healthy controls.

MSc, Biomedical Engineering, University of Oxford, UK (Sept. 2010 – Aug. 2011)

- Skye Scholarship (£25 000) and Sloane-Robinson Biomedical Scholarship, (£5 000).
- Grade 2:1
- Dell® social innovation award, for design of blood pressure device with Engineering World Health. Pitching to investors in London and Rome.
- University of Oxford Medtronic® Lecture showcase poster (only 2 of 30 selected), 2011.

MScEng cum laude (by research), Mechanical Engineering, Stellenbosch University, South Africa (Jan. 2004 – Mar. 2006), including 18-month research project.

PUBLICATIONS AND PATENTS:

- G. Milandri, S. Sivarasu. *A Randomized Controlled Trial of Eccentric versus Concentric Cycling for ACL Reconstruction Rehabilitation*, American Journal of Sports Medicine, Vol 49(3), 2021. Journal ranked in top three in orthopaedics and sports medicine.
- G. Milandri, M. Posthumus, T.J. Small, A. Bothma, W. van der Merwe, R. Kassanje, S. Sivarasu, *Kinematic and kinetic gait deviations in males long after anterior cruciate ligament reconstruction*, Clin Biomech, Vol 49, pp78-84, 2017.
- G. Milandri and W.M. van der Merwe, *Rehabilitation and return to sports after ACL reconstruction*, Aspetar Sports Medicine Journal, Vol. 6, Dec 2017.
- C. Fanciullacci, Z. McKinney, V. Monaco et al. *Survey of transfemoral amputee experience and priorities for the user-centered design of powered robotic transfemoral prostheses*. J NeuroEngineering Rehabil Vol 18(168), 2021.
- L. Cavallaro, F. Tessari, G. Milandri, et al., *Finite element modeling of an energy storing and return prosthetic foot and implications of stiffness on rollover shape*. Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine. Vol 236(2):218-227, 2022.
- Seven international conference publications.
- WO/2019/116254 Continuous Passive Motion Apparatus, Inventor.
- P101099GR00 A Prosthetic Joint and Prosthetic Limb Comprising the Same, Inventor.
- Three additional Patent Applications.

PRIZES, AWARDS, INVITED PRESENTATIONS

- Speaker: Invited Horizon2020 conference panellist, EU Science: Global Challenges, Global Collaboration (ES:GC2), European Parliament, Brussels, 2013. Topic: Frugal Innovation.
- 1st Prize - UK national Appathon, 2011. Prize: 10 Downing Street reception.
- *Associate Membership* (highest level), pan-African Harambe Entrepreneur Alliance. Awarded for pitch of Dartmouth Idea Paper (3% of over 1000 applicants selected).

TECHNICAL AND OTHER SKILLS

- Biomechanics: Vicon Nexus®, AMTI force plates, AMTI split treadmill.
- Data Processing/statistics (8 years): MATLAB®/Simulink, R statistical computing.
- Hardware/Test: Development of Labview® cRIO testbench, closed loop control.
- CAD (10 years): PTC CREO, SolidWorks/PDMWorks
- FEM (5+ years): PTC Pro/Mechanica®, SolidWorks.
- Languages: English (fluent), Italian (B2), Afrikaans (B1), Spanish (A2).