

Prosper Magara

Biomedical Engineer | Medical Equipment Field Service | Laparoscopic Surgery Technology

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[LinkedIn](#) · [ORCID](#) · [Google Scholar](#) · [GitHub](#) · [Portfolio](#)

PROFESSIONAL SUMMARY

Biomedical and electrical engineer with hands-on medical equipment experience since 2020 and a research specialism in laparoscopic and robot-assisted surgery. I have installed, calibrated, serviced and repaired X-ray, dialysis, autoclave, theatre and laboratory equipment at hospitals and clinics across Zimbabwe, keeping full service records and training clinical staff at handover. I now work alongside surgical teams at Groote Schuur Hospital as a Google PhD Fellow at the University of Cape Town, with time in theatre on da Vinci robot-assisted cases. I troubleshoot electro-mechanical and software faults methodically, including remote diagnostics, and communicate clearly with surgeons and hospital staff.

CORE COMPETENCIES

- **Field service:** installation, commissioning, calibration, preventive maintenance and repair of X-ray, dialysis, autoclave, theatre and laboratory equipment; spares, service reports and user training at handover.
- **Laparoscopy and surgical robotics:** laparoscopic video chains and instruments; da Vinci system exposure in theatre; LapSim simulator and box-trainer training; operating-theatre protocol.
- **Diagnostics and software:** electro-mechanical and embedded fault-finding (PIC, STM32, ATmega328); remote diagnostics and latency measurement tooling; Windows and Linux; Python, C#, JavaScript; Wi-Fi, GSM, 5G, WebRTC.
- **Customers and admin:** working relationships with surgeons and hospital staff; service records, inventories and technical reports; scheduling own site visits; supervising junior engineers and students.

PROFESSIONAL EXPERIENCE

PhD Researcher and Google PhD Fellow, University of Cape Town 2024 to present

- Work in theatre with surgical teams at Groote Schuur Hospital on laparoscopic cases and occasional da Vinci robot-assisted cases, following operating-theatre protocol and keeping day-to-day working relationships with surgeons and nursing staff.
- Built a real-time telementoring platform (dual-camera WebRTC streaming, telestration, two-way audio) for laparoscopic surgery.
- Designed and built a glass-to-glass latency rig (ATmega328 microcontroller, light sensors, desktop software) to diagnose and measure video delay across the full camera-to-display chain.
- Hands-on training on the LapSim simulator and box trainers; lead author of a systematic review of AI bleeding monitoring in laparoscopic and robot-assisted surgery (Journal of Robotic Surgery, 2026).

Medical Device Engineer, Med-Elect Technologies, Zimbabwe 2022 to 2023

- Planned and carried out installations of X-ray machines, dialysis machines, autoclaves, theatre beds and chemistry analysers at hospitals and clinics, from site planning to handover and user training.
- Serviced, calibrated and repaired equipment on site; ran preventive maintenance schedules, kept service records and managed spares.

Biomedical Engineering Attaché, Parirenyatwa Group of Hospitals, Harare 2022

- Kept the equipment inventory and carried out installation and maintenance across surgery, paediatrics, oncology, haematology, orthopaedics and radiography.
- Took part in a new MRI installation and a water-treatment plant installation.

Biomedical and IoT Engineer, SolidarMed, Zimbabwe 2020 to 2021

- Developed IoT health devices, implemented telemedicine tooling (REDCap), wrote technical reports and supervised four students on attachment.

Freelance Solar Systems Engineer, Zimbabwe 2018 to 2023

- Designed, installed and maintained off-grid and hybrid solar PV systems for homes, farms and clinics, working independently with each customer from site assessment to after-sales support.

EDUCATION

- **PhD, Biomedical Engineering**, University of Cape Town, 2024 to present. Telementoring and telesurgery with augmented reality and haptics over 5G.
- **MSc, Biomedical Engineering**, University of Zimbabwe, 2021 to 2022, distinction. Thesis: a smart health station for swab collection and patient data entry.
- **BSc (Hons), Electrical Engineering**, University of Zimbabwe, 2015 to 2019, upper second class.

AWARDS AND FELLOWSHIPS

- **2026:** PhD First Prize, Best Presenter Award, BME Ignite (HUB Biomedical Engineering Fusion event), University of Cape Town.
- **2024:** Google PhD Fellowship, for research combining AI and augmented reality in telementoring for laparoscopic surgery.
- **2019:** Best Innovative Project, University of Zimbabwe Research Week, for a smart egg incubator.
- Second Creative SDGs Idea, CBZ Bank Hacking for SDGs post COVID-19 hackathon, Zimbabwe.

SELECTED PUBLICATIONS

1. **Magara P**, Sivarasu S, Ras L, Biyabani A, Blocker A, Shabangu M, Malila B. AI-based automated bleeding monitoring in conventional and robot-assisted laparoscopic surgery: a systematic review. *Journal of Robotic Surgery* 2026;20(1):522.
2. **Magara P**, Sivarasu S, Ras L, Biyabani A, Malila B. Latency-aware evaluation of bleeding monitoring algorithms for real-time surgical applications. *Nordic Conference on Digital Health and Wireless Solutions*, Springer, 2026, pp. 51 to 69.
3. Blocker A, **Magara P**, Biyabani A, Datay MI, Mwangama J, Malila B. Design of a solar-based virtual clinic for austere environments. *IEEE AFRICON* 2025.
4. **Magara P**, Ras L, Biyabani A, Malila B. User-centred design of a tele-mentoring system for laparoscopic surgery in austere environments. *IEEE Globecom Workshops* 2024.
5. **Magara P**, Saruchera G, Mushiri T, Noorbhai H. Development of a semi-automatic, isolating and portable health station for swab collection and patient data entry. University of Zimbabwe, 2022.

ADDITIONAL INFORMATION

- **Languages:** English and Shona, both native.
- **Driver's licence:** valid, with a clean driving record.
- **Research groups:** Telemedicine and Connected Care (2024 to 2027) and UCT MedTech (2025 to 2027), University of Cape Town.
- **Work travel:** research visits to Rwanda, Italy and Finland.

REFEREES

- **Prof Sudesh Sivarasu**, PhD supervisor. Professor of Biomedical Engineering and DSI/NRF SARChI Research Chair, Head of UCT MedTech, University of Cape Town. sudesh.sivarasu@uct.ac.za
- **Dr Lamees Ras**, PhD co-supervisor. Consultant Urogynaecologist, Department of Obstetrics and Gynaecology, University of Cape Town and Groote Schuur Hospital. [email]
- **Prof Ahmed Biyabani**, PhD co-supervisor. Associate Teaching Professor, College of Engineering, Carnegie Mellon University Africa, Kigali. [email]