

ANTHONY MASUKU

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Data Management | Space Engineering & Satellite Data Systems | Systems Engineering & IT Infrastructure

PROFILE

Accomplished Space Systems Engineer with 24+ years of experience in satellite data systems, IT infrastructure, and systems engineering across government, academic, and research institutions. Skilled in managing Earth Observation ground segment systems, data processing, and satellite data verification to ensure mission reliability. Holds a Master's degree in Space Technology and Planetary Exploration with research expertise in planetary rover navigation and data fusion. Proficient in Python, MATLAB, enterprise system modeling, and IT infrastructure implementation to support complex space operations. Recognized for delivering innovative technical solutions and contributing to the growth of space science through research, education, and technology.

CORE SKILLS & COMPETENCIES

Satellite Data Systems | Space Engineering | Systems Engineering | IT Infrastructure | Data Verification | Earth Observation | Systems Integration | Research & Innovation | Systems Modeling | Space Robotics | Data Migration | Technical Troubleshooting | Mission Operations | Enterprise Architecture | Linux/UNIX Administration | Python Programming | MATLAB Analysis | Database Management | System Documentation | Space Science Outreach

SIGNATURE HIGHLIGHTS

- **Space Systems Expertise:** Brings nearly 5 years of dedicated experience managing Earth Observation satellite systems and ground segment operations, ensuring reliable data acquisition and mission success.
- **Systems Engineering Leadership:** Applies structured methodologies to design, implement, and optimize mission-critical IT and space infrastructures, enabling robust and scalable operations.
- **Data Accuracy & Integrity:** Demonstrates proven ability in data verification, migration, and management, safeguarding the accuracy of satellite and mission datasets essential for decision-making.
- **Research & Innovation Mindset:** Leverages advanced research in planetary rover navigation and data fusion, undertaken at Cranfield University, to drive technical innovation and advance planetary exploration applications.
- **Cross-Disciplinary Technical Skills:** Combines expertise in Python, MATLAB, enterprise architecture, and databases with system modeling and visualization tools to deliver end-to-end solutions.

WORK EXPERIENCE

Oportunidad Co. | Pretoria, South Africa | Dec 2020 - Present

Managing Director - Space Monitoring & Earth Observation Services

- Founding and leading Oportunidad Space Analytics, a startup venture focused on delivering satellite-based monitoring and reporting solutions for the Ports, Mining, Fleet Management, and Oil & Gas sectors, leveraging Synthetic Aperture Radar (SAR) and multi-sensor Earth Observation data to enable all-weather, day-and-night asset surveillance and operational intelligence.

- Architecting cloud-native EO data pipelines on Google Earth Engine (GEE), AWS, and OpenStack platforms, developing Python and JavaScript (GEE API) scripting frameworks for automated SAR interferometry (InSAR), coherence analysis, and subsidence monitoring to support infrastructure integrity assessments for pipelines, tailings dams, and port facilities.
- Building prototype EO-driven fleet management and maritime surveillance solutions integrating AIS vessel tracking with SAR analytics, alongside mining operation intelligence dashboards for land deformation monitoring, environmental compliance, and tailings dam safety assessment using L-band and C-band SAR data fusion.
- Researching emerging market trends in SAR analytics, AI-powered feature extraction, and multi-mission data fusion to align product innovation with evolving industry needs, while establishing strategic partnerships and securing long-term competitiveness in the Earth Observation services market for resource-sector clients.

South African National Space Agency (SANSA) | Pretoria, South Africa | Mar 2016 - Dec 2020

Systems Engineer

- Operated ground segment systems and managed Earth Observation data processing, ensuring accuracy and availability of mission-critical datasets.
- Structured complex IT infrastructure deployments, following strict documentation standards to align seamlessly with the Systems Development Life Cycle (SDLC).
- Investigated and swiftly resolved critical network and server issues, minimizing downtime and ensuring uninterrupted continuity of operations for satellite missions.
- Configured and maintained EO software applications, facilitating smooth access and dissemination of satellite data for internal and external stakeholders.
- Explored advanced emerging technologies, including OpenStack (SUSE and RedHat), to support datacenter upgrades and strategically future-proof operations.

Cranfield University | Bedfordshire, United Kingdom | May 2012 - Oct 2014

Researcher

- Applied advanced laser speckle velocimetry and odometry within a Kalman Filter framework to significantly advance planetary rover positioning research.
- Constructed a kinematic rover model using MATLAB, improving accuracy in rover navigation studies.
- Evaluated innovative IT applications and Unicenter systems for potential integration into space operations, directly contributing to advanced academic research.
- Authored comprehensive technical documentation and presented research findings that deepened understanding of rover mobility in complex planetary environments.

Freelancer | Seoul, South Korea & USA (Remote) | Sep 2010 - Jun 2012

- Conducted tailored English instruction to diverse age groups, applying innovative teaching methods.
- Designed and maintained a website for a U.S.-based nonprofit, strengthening its online presence and outreach.

University of Surrey | Guildford, United Kingdom | Sep 2006 - Jun 2010

IT ResNet Advisor

- Diagnosed and rectified technical issues in student labs, streamlining operations and reducing downtime.
- Installed and configured Windows and Linux OS, supporting efficient computing environments for academic users.
- Implemented antivirus and network security protocols, safeguarding institutional systems against cyber threats.

EARLY CAREER SNAPSHOT

Information Technology Auditor | The Open University, UK | 2005

IT Consultant | Hurst Consulting, UK | 2004

IT Consultant | BancTec, USA | 2003-2004

Data Verification Specialist | Select Agency, UK | 2002-2003
System Engineer | Fujitsu, UK | 2001-2002
Technical Consultant | Computer Associates, SA | 1999-2001
IT Technician | Century Analysis Inc., USA | 1997-1998
Technical Instructor | Foundation Technical College, USA | 1996-1997

EDUCATION

- Master's by Research, Aerospace / Space Engineering | Cranfield University | Cranfield, United Kingdom | 2012–2013
- Master of Engineering, Space Technology and Planetary Exploration | University of Surrey | Guildford, United Kingdom | 2006–2010
- Associate in Applied Science, Electronics and Computing Technology | Heald College | Concord, United States | 1994–1996

CERTIFICATIONS

Architecting in AWS | Amazon Web Services | Online
Earth Observation from Space: The Optical View | European Space Agency | United Kingdom | 2018
Spanish Language Certificate | Online