science, technology & innovation
Department:
Science, Technology and Innovation
REPUBLIC OF SOUTH AFRICA

CSIR
Touching lives through innovation

GROUND SURVEILLANCE AND CLASSIFICATION RADAR

"Meerkat Mk II"

Wide-area awareness. Automated intelligence. 24/7 all-weather performance.

The Ground Surveillance and Classification Radar (GSCR) is a next-generation ground surveillance radar built on **digital phased array technology**, enabling fast electronic beam steering and precise digital beamforming. Its integrated architecture fuses **detection, tracking and target classification** into a single process – delivering a **true, non-cooperative recognised area picture** without relying on constant operator input.

Operating **day or night, in all weather**, the GSCR provides **near real-time coverage of large areas**, making it ideal for border protection, wildlife protection, critical infrastructure security and high-value site monitoring.

Automated behaviour analytics allow the system to **identify suspicious activity and trigger alerts**, reducing the need for full-time operators and lowering overall operating costs. Decision-makers receive a **continuous, actionable situational picture and timeous alerts**, enabling faster, more informed responses in dynamic environments.

The GSCR delivers a modern, intelligence-driven surveillance capability designed for security operations that demand reliability, scalability and rapid situational understanding.

CONTACT DETAILS:

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Type	Active Electronically Steered Digital Array Radar
Frequency	C-band
Detection range of single humans	Different options available between 4 km and 10 km
Azimuth sector size	90^{o} per face; 1 to 4 faces per radar system
Coverage angles	Azimuth: Configurable in 90^{o} sectors up to 360^{o} Elevation: 15^{o} with high back-angle option
Azimuth Update Period	Configurable typically 3 sec per 90^{o} sector
Minimum detectable target velocity	0.3 m/s (radial)
Azimuth angle accuracy	< $0{,}45^{o}$ (40 m at 5 km range)
Power consumption	700 W average for continuous operation

Physical characteristics				
Antenna (Ranges against single humans)		**4 km version**	**7 km version**	**10 km version**
	Width:	0.6 m	0.9 m	0.9 m
	Height:	0.45 m	0.45 m	0.6 m
	Depth:	0.24 m	0.24 m	0.24 m
	Mass:	15 kg estimated	30 kg estimated	50 kg estimated

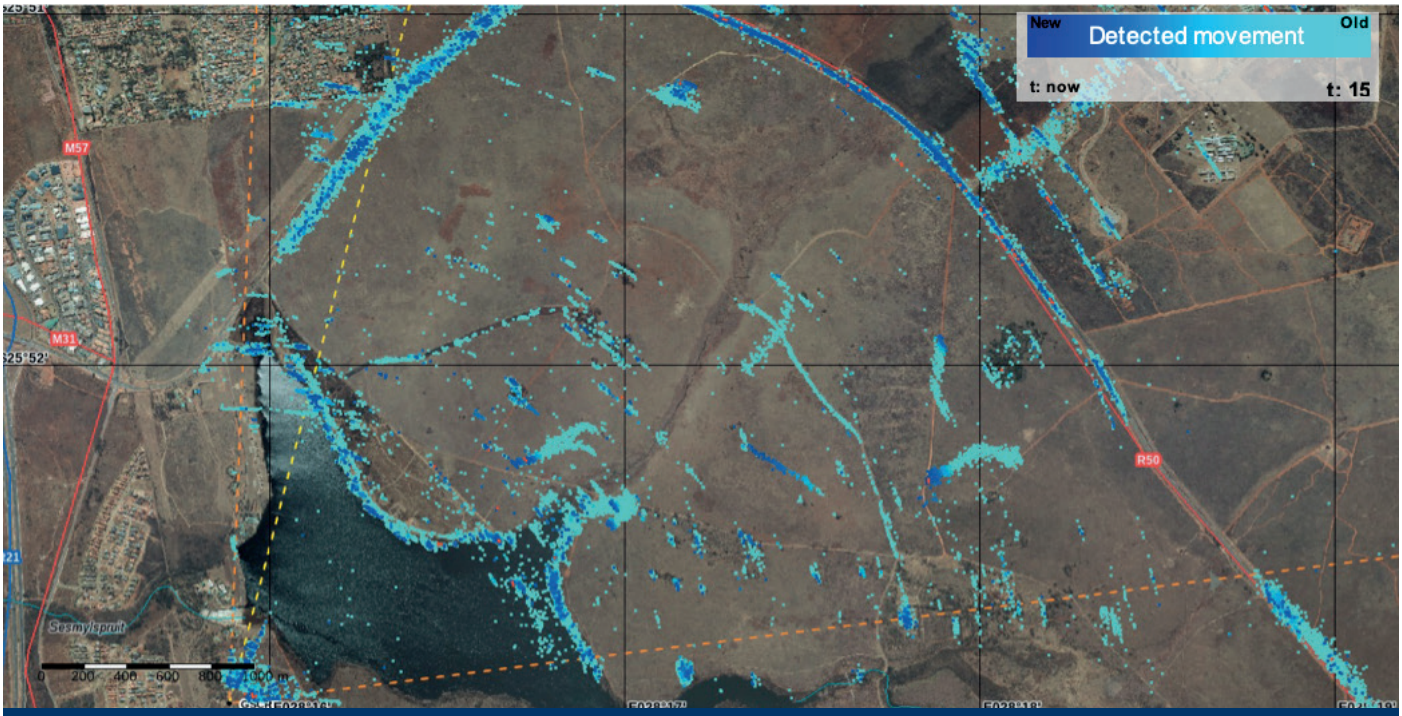

Figure 1: Surveillance picture at Rietvlei Nature Reserve in Gauteng, South Africa, showing only detected moving targets

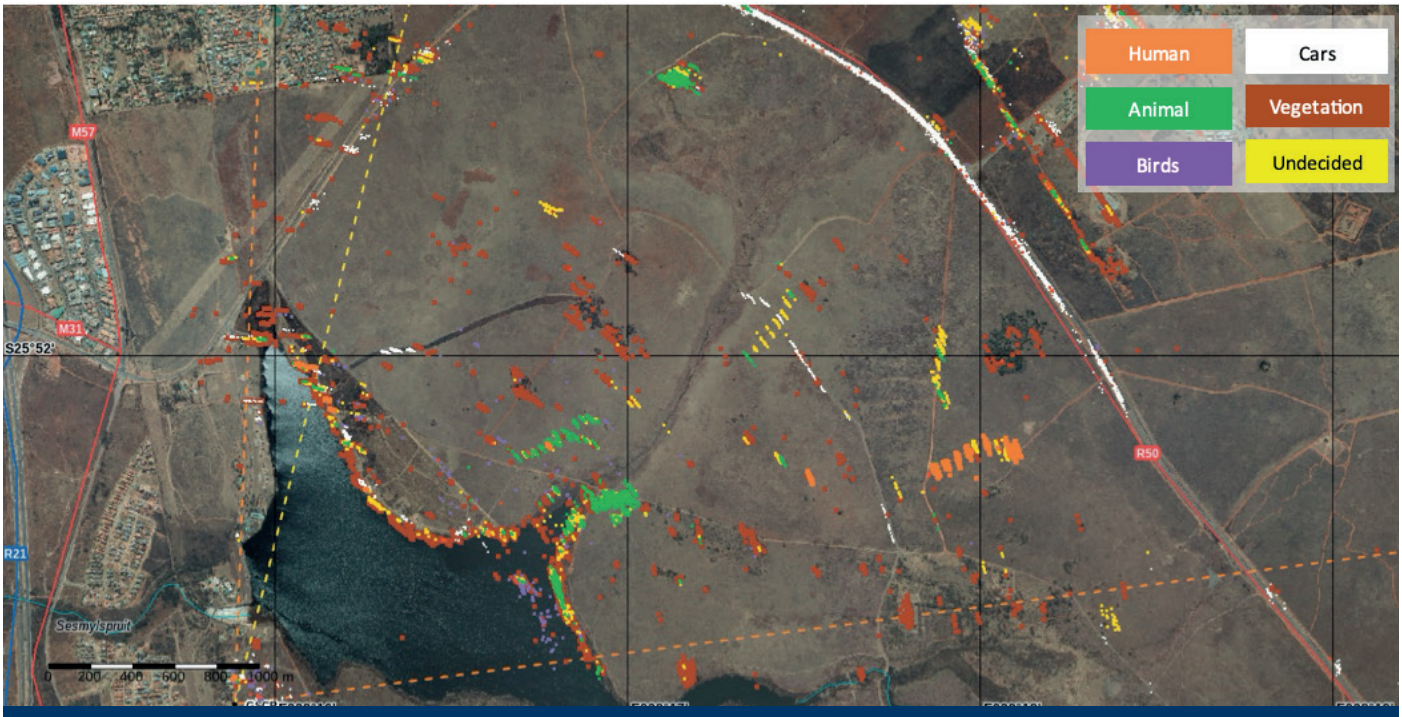

Figure 2: The same surveillance picture at Rievlei Nature Reserve, showing automatically classified detections