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Sole Source Authority

TECH OVERVIEW – CURRENT STATE

- ❑ **Phase I (complete):** proved feasibility of generative transformers for 3D environmental generation; demonstrated GIS/remote sensing conditioned scene generation in test areas.
- ❑ **State-of-the-art:** Current 3D development is manual, repetitive and impossible to scale. Our technology is **50x faster**, increasing mission readiness and training scalability.
- ❑ **Phase II:** scale fidelity, controllability, and runtime performance for training/mission-planning use.

SBIR/STTR OBJECTIVES

- ❑ Deliver an operational prototype that generates 10km² structured 3D environments from text plus GIS/remote-sensing inputs.
- ❑ Integrate/export to UNREAL ENGINE with editable scene graphs viewable on laptops, tablets, and XR devices.
- ❑ Validate with users (mission planning, ground training, drone sims) and deliver two demo scenarios + metrics report + Phase III transition package.

INNOVATION

- ❑ **Spatially grounded generation:** AI system learns object placement + hierarchy for sim-usable structure (not just visuals).
- ❑ **Building Interiors:** fully furnished, realistic, complex digital twins generated from architectural plans.
- ❑ **Runtime-ready worlds:** optimized assets and lazy loading techniques enable responsive interaction with low memory overhead

TECHNICAL APPROACH – EXECUTIVE SUMMARY

- ❑ **Phase I Feasibility (complete):** (1) evaluated generative transformer on toy/small datasets for spatial relationships + object placement; (2) demonstrated GIS/remote-sensing scene generation in manageable test environments; (3) assessed compression + lazy-loading to minimize memory overhead for interactive use.
- ❑ **Phase II Plan:** scale to 10km² generations; add constraint controls + deterministic seeding; harden GIS ingestion; integrate exporter/importer for Unreal Engine; run user evaluations with stakeholders.
- ❑ **Deliverables/Demos:** integrated operational prototype, two mission-relevant demos, evaluation report, and transition package (APIs/docs/deployment).

