


CARLA-Air: Drones and Self-Driving Cars in One Simulator, No Bridge Required

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CARLA-Air: Drones and Self-Driving Cars in One Simulator

Unified air-ground simulation in a single Unreal Engine process

- 18** Sensor modalities per frame
Air and ground aligned
- 317+** GitHub stars in days
#1 Paper of the Day on HF
- 0 ms** Bridge overhead
Single-process, no sync lag

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Researchers at Peking University released [CARLA-Air](#), an open-source simulator that puts drones and self-driving cars in the same physically consistent world. Today's tools are split: driving simulators like [CARLA](#) can't fly, and flight simulators like the now-archived [AirSim](#) can't drive through realistic cities. Connecting them via a network bridge adds 1 to 5 ms of sync overhead and breaks spatial-temporal consistency. CARLA-Air merges both into a single

[Unreal Engine](#) process: one physics tick, one rendering pipeline, zero bridge. It preserves both CARLA's and AirSim's Python APIs and ROS 2 interfaces, so existing codebases work without modification. The platform captures [18 sensor modalities](#) per frame (RGB, depth, LiDAR, radar, IMU, and more), all aligned across air and ground agents. It sustains around 20 FPS under joint workloads and ran stable for 3+ hours with 357 spawn/destroy cycles and zero crashes.

For anyone building coordinated air-ground systems, this fills a real gap. Disaster-response teams training drones to scout while ground robots navigate, or delivery networks coordinating aerial and street-level vehicles, now have a simulator where both agents share the same rain, traffic, and physics. The project also revives AirSim's flight stack inside modern infrastructure, giving the drone research community a maintained path forward. It hit [#1 Paper of the Day on Hugging Face](#) and crossed 317 GitHub stars within days.

Simulation platforms are consolidating. Instead of domain-specific tools stitched together, the field is moving toward unified environments where heterogeneous agents coexist natively. [RynnBrain](#) showed one model handling multiple robotic capabilities; CARLA-Air extends that unification to the simulation layer itself.

Sources:

- [CARLA-Air Paper \(arXiv\)](#)
- [CARLA-Air GitHub Repository](#)
- [Hugging Face Daily Papers](#)
- [CARLA Simulator](#)
- [Microsoft AirSim \(Archived\)](#)

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