

Processing 3D Drone Models from Repositories to Omniverse

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Abstract—This report compiles information about 3D model repositories, both public and private, with a particular focus on those that provide drone models. Explores the characteristics of each repository and highlights examples of freely available models. Furthermore, the report demonstrates the process of importing 3D assets from these repositories into Unity and Blender, followed by exporting them to NVIDIA Omniverse. Two approaches for integrations with Omniverse are presented: the use of official connectors and the automation of workflows through Python scripting. This study aims to provide a structured overview and practical guidelines for researchers and developers working with 3D drone models in extended design pipelines.

Index Terms—NVIDIA, Omniverse, Drones, Unity, Blender, 3D-models.

I. INTRODUCTION

THE rapid growth of 3D content creation has transformed industries ranging from entertainment and video games to engineering and robotics. As the demand for realistic digital assets increases, designers and researchers are increasingly turning to online repositories to access pre-designed models, rather than creating each asset from scratch. This trend has had a particular impact on the field of unmanned aerial vehicles (UAVs), where 3D drone models are used for simulation, prototyping, and visualization.

Public and private 3D repositories offer a wide variety of models in different formats, with varying levels of complexity and licenses. These platforms not only save time and resources, but also foster collaboration and knowledge sharing among developers and hobbyists. Using these repositories, users can accelerate design cycles, test ideas in virtual environments, and integrate models into advanced simulation platforms such as NVIDIA Omniverse.

This report explores the landscape of 3D modeling repositories, focusing on drone models. It presents a systematic review of the most popular platforms, highlights key features, and provides examples of available resources. Additionally, the report demonstrates practical workflows for importing models into Unity and Blender and exporting them to Omniverse using graphical connectors and Python-based automation. By documenting these procedures, the report aims to serve as a reference for individuals and teams seeking to efficiently integrate existing 3D resources into high-fidelity simulation processes.

II. 3D MODELING REPOSITORIES

In recent years, a wide variety of online platforms have emerged that host extensive libraries of 3D models. These

repositories provide access to digital assets that cover not only drones but also countless other objects in various categories such as vehicles, architecture, characters, and consumer products. Most of these platforms are publicly accessible, offering free and paid resources, and have become valuable tools for designers, engineers, researchers, and hobbyists seeking to accelerate their projects by reusing or customizing existing 3D models.

A. Sketchfab

Sketchfab is driving a new era of creativity by making it easy to publish and find 3D content online. With a community of millions of creators who have published millions of models, they describe themselves as one of the largest platforms for immersive and interactive 3D. Additionally, their store allows buyers and sellers to confidently transact 3D models using their real-time viewer and model inspector.

Sketchfab's technology is integrated with leading 3D creation tools and publishing platforms and is compatible with all browsers, operating systems, computers, and mobile devices. They also offer VR and AR support on compatible hardware. Their robust APIs allow developers to directly upload and download 3D models and configure their embeddable 3D viewer to their needs [1].

Here are some examples of 3D drone models that can be found on the platform:

- UAV Drone Shop (War Thunder) Props
- Drone 3D
- Quadcopter drone

B. Thingiverse

Thingiverse is a dynamic design community for discovering, creating, and sharing 3D printable objects.

They believe that everyone should be encouraged to create and remix 3D objects, regardless of technical experience or prior knowledge. In order to maintain an open platform, they recommend that all designs be licensed under a Creative Commons license, meaning anyone can use or modify any design [2].

Here are some examples of 3D drone models that can be found on the platform:

- T4 Quadcopter Drone
- Garud-500 DIY Drone
- Quadcopter

C. GrabCAD

GrabCAD's open, enterprise-ready software platform powers additive manufacturing at scale through connected solutions. It is geared toward engineering and product design, rather than purely artistic 3D modeling.

The site is known for its integration with CAD tools such as SolidWorks, AutoCAD, and CATIA, and is commonly used in academic and professional settings. GrabCAD is a public platform and most of the resources are free, although they are primarily geared toward CAD use, rather than ready-to-use resources for video games or films[3].

Here are some examples of 3D drone models that can be found on the platform:

- Drone Multipurpose (Spraying-Mapping)
- Hexa H6 short-range combat UAV
- "Quadcopter UAV with Integrated Camera – Complete SolidWorks Assembly

D. Free3D

Free3D is a community platform that offers free and paid 3D models. According to the company, it was created to help creators quickly find quality resources and encourage sharing among 3D artists.

The platform offers models in common formats such as .fbx, .obj, and .3ds, making them easy to import into most 3D programs. Although many models are free to download, Free3D also offers premium models for sale. Free3D is a public platform with free and paid resources [4].

Here are some examples of 3D drone models that can be found on the platform:

- Drone
- Storm Drone 6
- Super Drone

E. CGTrader

CGTrader is one of the leading platforms in the 3D model market, a hub for using and contributing to the world of 3D design. Whether you are looking for resources for your projects or offering your own creations, CGTrader offers the platform and community you need to make it happen [5].

Here are some examples of 3D drone models that can be found on the platform:

- Drone Concept 3d Model
- Drone with four propellers
- X-Black Drone - Quadcopter

F. 3D Warehouse

3D Warehouse is a searchable, pre-built 3D model website that works seamlessly with SketchUp. 3D Warehouse is a great resource and online community for anyone creating or using 3D models. The platform is tightly connected to SketchUp software, allowing users to import/export models directly. Models are typically optimized for SketchUp workflows rather than Blender/Unity pipelines. 3D Warehouse is public and free, although use is subject to the SketchUp license terms [6].

Here are some examples of 3D drone models that can be found on the platform:

- Drone
- UAV Dragonfly
- DRONE

G. TurboSquid

TurboSquid defines itself as the global source for professional 3D models. It is widely used in industries such as video games, architecture, design, and visual effects.

It offers an extensive library of models in various categories, with strict quality standards. TurboSquid also offers Check-Mate certification, which guarantees that a model meets technical and professional requirements. It is a public, primarily commercial platform, although it includes a smaller selection of free resources [7].

Here are some examples of 3D drone models that can be found on the platform:

- Mini Drone
- M300 Drone
- Drone

H. Unity Asset Store

The Unity Asset Store contains a library of free and commercial assets that Unity Technologies and members of the community create. A wide variety of assets are available, including textures, models, animations, complete project examples, tutorials, and extensions for the Unity Editor.

Resources can be free or paid, and their quality ranges from community-contributed items to professional studio packages. The store integrates directly with the Unity Editor, making it extremely easy to import models. It is a public platform with a mix of free and commercial content [8].

Here are some examples of 3D drone models that can be found on the platform:

- Simple Drone
- Realistic Drone
- Military Cargo Aircraft

I. Superhive Blender Market

Blender Market's Superhive is an online marketplace created by the Blender Foundation and the community, focused on resources that work seamlessly with Blender. The platform prioritizes open source development, with a percentage of sales going directly to the Blender development fund.

It offers models, add-ons, materials, and platforms optimized for Blender workflows. The platform is public, but almost all content is paid, with a few exceptions [9].

Here are some examples of 3D drone models that can be found on the platform:

- Parrot Drone
- Dji Phantom 3
- Dji S900 Hexacopter Drone

J. GitHub

GitHub is the home of all developers: a platform where you can share code, contribute to open source projects, or even automate your workflow with tools like GitHub Actions and Packages. GitHub is known as a space for version control and collaboration.

GitHub, while not primarily a 3D repository, contains numerous open source projects, including 3D models, CAD files, and even drone simulation environments.

As a version control and collaboration platform, it allows sharing of source files, drone code, and corresponding 3D resources. Access depends on the visibility of the repository: public repositories are free, while private ones require permissions [10].

Here are some examples of 3D drone models that can be found on the platform:

- Drone-Project-CAD
- Drone
- OpenDrone

III. EXAMPLE: FROM UNITY TO OMNIVERSE

To illustrate the workflow from a 3D repository to NVIDIA Omniverse, we present the following case study, where a drone model is first imported into Unity and subsequently prepared for integration with Omniverse.

The process begins by downloading a 3D model from Sketchfab: UAV Drone Shop (War Thunder) Props. Sketchfab provides the option to export in multiple formats, and in this case the .obj format is selected because it is widely supported and directly compatible with Unity projects. Once the file has been downloaded, it can be extracted locally, ensuring that both the geometry file and any associated texture files are kept in the same folder for proper material mapping.

Next, a new 3D project is created in Unity using the Built-In Render Pipeline. This is the default pipeline in Unity, making it straightforward to work with external assets. At this stage, the Unity Editor initializes a project workspace, generating a default set of folders such as Assets, Scenes, and Packages. All imported resources must be placed within the Assets folder. The downloaded drone model is then copied to the Assets folder of the Unity project. Upon doing so, Unity automatically detects and imports the asset, displaying the model inside the Project view. From there, the model can be dragged into the Hierarchy panel to instantiate it within the active scene. Once present in the scene, the object can be manipulated directly: scaling it up or down, rotating its orientation, and moving it within the 3D environment. Unity's Inspector window provides fine-grained control over these transformations.

A. Unity Connector for Omniverse

The next step is to enable the interoperability between Unity and NVIDIA Omniverse through the official Unity Connector. NVIDIA provides this connector as part of its suite of Omniverse tools, allowing Unity users to export or live-sync models into the USD (Universal Scene Description) format used by Omniverse.

The connector must first be downloaded from the official NVIDIA Omniverse website [11]. Once obtained, the installer is loaded into Unity, either through Unity's package manager or as a custom package import. The installation adds a dedicated Omniverse menu and toolbar inside the Unity Editor. In parallel, the Omniverse Launcher application is used to install the Unity Connector on the Omniverse side. This ensures compatibility between Unity's export pipeline and Omniverse's import pipeline. Once installation is complete, Unity will display a new "Omniverse" tab within the Editor interface. From here, assets can be exported directly into an Omniverse Nucleus server or imported from Omniverse into the Unity workspace. This integration allows developers to seamlessly bridge both environments, making it possible to take advantage of Unity's real-time development tools alongside Omniverse's collaborative and physically accurate simulation capabilities. In summary, the workflow demonstrated here—starting with the download of a 3D drone model, importing it into Unity, and setting up the Unity Connector for Omniverse—provides a clear example of how existing 3D content can be integrated into the NVIDIA ecosystem. This process opens the door to collaborative high-fidelity simulations and advanced visualization pipelines.

B. Python-based export from Unity to Omniverse

In addition to the graphical interface provided by the Omniverse Connector, it is possible to automate the transfer of assets to Omniverse through Python scripting. The general workflow consists of first exporting the selected 3D model in Unity to the USD format, and then using the Omniverse Python API to publish it to a Nucleus server. This approach allows batch processing, integration with pipelines, or automated synchronization between platforms.

An example script is shown below:

```
import omni.client

# Path to local USD file exported from
# Unity
src_path = "C:/UnityProjects/Drone/Export_"
# s/drone.usd"

# Destination in Omniverse Nucleus
dst_path = "omniverse://localhost/Users/S_"
# hared/Drone/drone.usd"

# Perform the copy
result, error = omni.client.copy(src_path,
# dst_path)
if result == omni.client.Result.OK:
    print("Model successfully exported to"
# Omniverse.")
else:
    print(f"Export failed: {error}")
```

This script uses the Omniverse `omni.client` library to establish a connection and transfer the file. The same logic can be extended to export multiple assets, automate version control, or even create continuous integration workflows for 3D content [12].

IV. EXAMPLE: FROM BLENDER TO OMNIVERSE

In this section, we describe an end-to-end example of how a 3D drone model can be prepared and exported to NVIDIA Omniverse using Blender with the Omniverse integration. This workflow illustrates how publicly available models can be adapted for use in advanced simulation and visualization platforms.

The process begins with the download of a suitable drone model. For this example, the model Drone with four propellers, available on CGTrader, was selected. The file is distributed in the .blend format, which makes it directly compatible with Blender. Once the file has been downloaded, it can be opened without requiring intermediate conversions. This avoids potential issues related to loss of geometry or material definitions that sometimes occur when working with interchange formats such as .obj or .fbx.

A. Blender 4.2 alpha USD branch

Blender 4.2 Alpha is an experimental release available on Omniverse Launch, designed to improve interoperability in 3D workflows by streamlining USD import and export, and integrating support for Omniverse MDL materials via the Universal Material Mapper plugin. Blender is a free and open-source 3D creation suite that covers the entire digital production pipeline—modeling, rigging, animation, simulation, rendering, compositing, motion tracking, video editing, and 2D animation—developed and maintained by the Blender Foundation and the Blender Institute, independently of NVIDIA. Distributed under the GNU General Public License (GPL), Blender grants the freedom to use it for any purpose, to study and modify its code, and to distribute both the original and derivative versions. Upon opening the .blend file with this version, the drone model is displayed within the 3D viewport. At this point, the user can interact with the model as in any Blender workflow: adjusting its position, inspecting the mesh, scaling it if necessary, or making corrections to the materials. A key feature of the Omniverse branch of Blender is the native integration of the Omniverse Connector add-on. This integration allows for seamless communication between Blender and Omniverse applications, such as Create or Isaac Sim. By navigating to the Edit → Preferences → Add-ons menu and searching for “Omniverse”, one can verify that the connector is enabled. Unlike the standard Blender distribution, this integration is already bundled and requires no manual installation.

Once the add-on is active, a new Omniverse tab appears within Blender’s interface. This panel provides options for both importing assets from Omniverse and exporting local scenes to the USD format. Through the export functionality, the drone model can be published directly to an Omniverse Nucleus server (via an omniverse:// path) or saved as a local USD file. In either case, the model becomes immediately accessible within the Omniverse ecosystem, ready to be visualized or integrated into simulation environments. This example demonstrates how the combination of Blender’s modeling tools with Omniverse’s USD-based interoperability creates

a straightforward pathway for transferring assets. It highlights the practicality of using existing 3D model repositories together with Omniverse’s powerful real-time collaborative environment.

B. Python-based export from Blender to Omniverse

Blender’s integration with Omniverse through the USD branch available in Omniverse Launch not only provides a graphical interface, but also exposes Python functions that allow automated publishing of models. This enables users to script the entire workflow, from exporting a scene to USD to uploading it directly to Omniverse Nucleus.

For example, the following script exports the currently open Blender scene to USD and publishes it to a Nucleus server:

```
import bpy
import omni.client

# Define destination in Omniverse
output_path = "omniverse://localhost/User_"
    ↵ s/Shared/Drone/drone.blender.usd"

# Export current Blender scene as USD
bpy.ops.wm.usd_export(filepath="C:/Temp/d_
    ↵ rone.blender.usd")

# Transfer exported file to Omniverse
src_path = "C:/Temp/drone.blender.usd"
result, error = omni.client.copy(src_path,
    ↵ output_path)

if result == omni.client.Result.OK:
    print("Drone successfully exported
        ↵ from Blender to Omniverse.")
else:
    print(f"Export failed: {error}")
```

This workflow demonstrates how Blender can be fully integrated into automated pipelines. By combining bpy scripting with the Omniverse API, it becomes possible to streamline repetitive tasks and ensure consistent publishing of assets in collaborative environments [13]

V. CONCLUSION

This report has mapped the landscape of 3D modeling repositories, highlighting the public and private platforms that provide drone models. By exploring the features of each repository and presenting concrete examples, it shows how these resources can be directly integrated into Unity and Blender workflows.

Furthermore, the report demonstrated the interoperability between these tools and NVIDIA Omniverse. Using official connectors and Python-based automation, it illustrates how resources can be exported to Omniverse for collaborative, high-fidelity simulation.

In conclusion, the combination of freely accessible repositories, flexible design tools, and the Omniverse ecosystem enables a powerful workflow to reuse, adapt, and simulate 3D drone models. Future work could explore automating

broader workflows, extending resource validation to simulate readiness, and applying these methods to broader categories of models beyond drones.

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