Lidar Debugging & Scanning Config

Enable/Disable Lidar Debug Lines

1. Open the **Stage** in Isaac Sim.
2. Navigate to: `/World/Robot/ur10/ee_link/Lidar`
3. Scroll down to **Raw USD Properties**.
4. Toggle **Draw Lines** to enable or disable lidar debug visualization.

Modify Scanning Height

- Open `rmpflow_controller.py`.
- Locate the function:

```
def get_arc_points()
```

- Adjust the `radius_scaling` variable:
  - Increase the value to raise the scan height.
  - Decrease the value to lower the scan height.

Change Lidar Resolution

- Modify the `num_samples` variable to control how many lidar points are captured.

Running the Main Script

To run the main pipeline and obtain screw locations:

```
C:\IsaacSim\python.bat main.py
```

Visualizing the Point Cloud (Optional)

1. Open `GeneratePointCloud.py` in **Visual Studio Code**, within your virtual environment.
2. Run the script to view the point cloud data.

Dependencies

If the required packages aren't installed, use one of the following:

In Isaac Sim terminal:

```
C:\IsaacSim\python.bat -m pip install open3d matplotlib numpy scipy
```

In your VS Code virtual environment:

```
pip install open3d matplotlib numpy scipy
```

Camera Views

You can switch between the **Top Camera** and the **EEF Camera** by changing the perspective in the Stage view. Isaac Sim also allows you to open multiple viewports to display both perspectives at the same time.

Prerequisites Before Running

Before running the main script, make sure to:

- Update the `save_path` in `main.py`.
- Update the `stage_path` to match your local file structure.
- Ensure the path to the screw `.usd` file is correct:
    - Open the stage manually in Isaac Sim.
    - Refresh the path to the screw model.
- The current setup uses `M4x25mm` screws.
