

```
# Install required packages
```

```
!apt update && apt install -y openslide-tools
```

```
!pip install cellvit
```

```
Get:1 http://security.ubuntu.com/ubuntu jammy-security InRelease [129 kB]
Hit:2 https://cloud.r-project.org/bin/linux/ubuntu jammy-cran40/ InRelease
Hit:3 http://archive.ubuntu.com/ubuntu jammy InRelease
Hit:4 https://developer.download.nvidia.com/compute/cuda/repos/ubuntu2204/x86\_64 InRelease
Hit:5 https://r2u.stat.illinois.edu/ubuntu jammy InRelease
Get:6 http://archive.ubuntu.com/ubuntu jammy-updates InRelease [128 kB]
Hit:7 https://ppa.launchpadcontent.net/deadsnakes/ppa/ubuntu jammy InRelease
Hit:8 https://ppa.launchpadcontent.net/graphics-drivers/ppa/ubuntu jammy InRelease
Hit:9 https://ppa.launchpadcontent.net/ubuntuugis/ppa/ubuntu jammy InRelease
Hit:10 http://archive.ubuntu.com/ubuntu jammy-backports InRelease
Get:11 http://archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [1,540 kB]
Get:12 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [3,092 kB]
Fetched 4,889 kB in 2s (2,838 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
41 packages can be upgraded. Run 'apt list --upgradable' to see them.
W: Skipping acquire of configured file 'main/source/Sources' as repository 'https://r2u.stat.illinois.edu/ubuntu jammy InRel
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
openslide-tools is already the newest version (3.4.1+dfsg-5build1).
0 upgraded, 0 newly installed, 0 to remove and 41 not upgraded.
Requirement already satisfied: cellvit in /usr/local/lib/python3.11/dist-packages (1.0.0b0)
Requirement already satisfied: colorama in /usr/local/lib/python3.11/dist-packages (from cellvit) (0.4.6)
Requirement already satisfied: colour in /usr/local/lib/python3.11/dist-packages (from cellvit) (0.1.5)
Requirement already satisfied: einops>=0.6.1 in /usr/local/lib/python3.11/dist-packages (from cellvit) (0.8.1)
Requirement already satisfied: gejson>=2.0.0 in /usr/local/lib/python3.11/dist-packages (from cellvit) (3.2.0)
Requirement already satisfied: natsort in /usr/local/lib/python3.11/dist-packages (from cellvit) (8.4.0)
Requirement already satisfied: numba>=0.58.0 in /usr/local/lib/python3.11/dist-packages (from cellvit) (0.60.0)
Requirement already satisfied: numpy<2.0.0 in /usr/local/lib/python3.11/dist-packages (from cellvit) (1.23.5)
Requirement already satisfied: opencv-python-headless==4.7.0.72 in /usr/local/lib/python3.11/dist-packages (from cellvit) (4
Requirement already satisfied: opt-einsum>=3.3.0 in /usr/local/lib/python3.11/dist-packages (from cellvit) (3.4.0)
Requirement already satisfied: pandas<2.0.0,>=1.4.3 in /usr/local/lib/python3.11/dist-packages (from cellvit) (1.5.3)
Requirement already satisfied: pathopatch>=1.0.6 in /usr/local/lib/python3.11/dist-packages (from cellvit) (1.0.6)
Requirement already satisfied: pydantic==1.10.4 in /usr/local/lib/python3.11/dist-packages (from cellvit) (1.10.4)
Requirement already satisfied: pydicom==2.4.4 in /usr/local/lib/python3.11/dist-packages (from cellvit) (2.4.4)
Requirement already satisfied: ray>=2.9.3 in /usr/local/lib/python3.11/dist-packages (from ray[default]>=2.9.3->cellvit) (2.
Requirement already satisfied: scikit-image>=0.19.3 in /usr/local/lib/python3.11/dist-packages (from cellvit) (0.24.0)
Requirement already satisfied: scipy>=1.8.0 in /usr/local/lib/python3.11/dist-packages (from cellvit) (1.14.1)
Requirement already satisfied: shapely==1.8.5.post1 in /usr/local/lib/python3.11/dist-packages (from cellvit) (1.8.5.post1)
Requirement already satisfied: ujson==5.8.0 in /usr/local/lib/python3.11/dist-packages (from cellvit) (5.8.0)
Requirement already satisfied: python-snappy in /usr/local/lib/python3.11/dist-packages (from cellvit) (0.7.3)
Requirement already satisfied: tqdm in /usr/local/lib/python3.11/dist-packages (from cellvit) (4.67.1)
Requirement already satisfied: psutil in /usr/local/lib/python3.11/dist-packages (from cellvit) (5.9.5)
Requirement already satisfied: pyaml in /usr/local/lib/python3.11/dist-packages (from cellvit) (25.1.0)
Requirement already satisfied: typing-extensions>=4.2.0 in /usr/local/lib/python3.11/dist-packages (from pydantic==1.10.4->c
Requirement already satisfied: llvmlite<0.44,>=0.43.0dev0 in /usr/local/lib/python3.11/dist-packages (from numba>=0.58.0->ce
Requirement already satisfied: python-dateutil>=2.8.1 in /usr/local/lib/python3.11/dist-packages (from pandas<2.0.0,>=1.4.3-
Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.11/dist-packages (from pandas<2.0.0,>=1.4.3->cellvit)
Requirement already satisfied: Pillow>=9.5.0 in /usr/local/lib/python3.11/dist-packages (from pathopatch>=1.0.6->cellvit) (1
Requirement already satisfied: PyYAML in /usr/local/lib/python3.11/dist-packages (from pathopatch>=1.0.6->cellvit) (6.0.2)
Requirement already satisfied: future in /usr/local/lib/python3.11/dist-packages (from pathopatch>=1.0.6->cellvit) (1.0.0)
Requirement already satisfied: matplotlib in /usr/local/lib/python3.11/dist-packages (from pathopatch>=1.0.6->cellvit) (3.10
Requirement already satisfied: openslide_python in /usr/local/lib/python3.11/dist-packages (from pathopatch>=1.0.6->cellvit)
Requirement already satisfied: rasterio==1.3.5.post1 in /usr/local/lib/python3.11/dist-packages (from pathopatch>=1.0.6->cel
Requirement already satisfied: requests in /usr/local/lib/python3.11/dist-packages (from pathopatch>=1.0.6->cellvit) (2.32.3
Requirement already satisfied: setuptools<=65.6.3 in /usr/local/lib/python3.11/dist-packages (from pathopatch>=1.0.6->cellvi
```

```
!apt install -y libvips-tools
```

```
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
libvips-tools is already the newest version (8.12.1-1build1).
0 upgraded, 0 newly installed, 0 to remove and 41 not upgraded.
```

```
# Verify installation
```

```
!cellvit-check
```

```
2025-04-05 02:11:27,409 - Check-System - WARNING - To check the environment, the following python path is used:
2025-04-05 02:11:27,409 - Check-System - WARNING - /usr/bin/python3
```

```
***** Necessary Modules *****
```

```
2025-04-05 02:11:27,409 - Check-System - INFO - Checking library torch
2025-04-05 02:11:27,409 - Check-System - INFO - Module installed and loaded
```

```

2025-04-05 02:11:27,409 - Check-System - INFO - Checking library torchaudio
2025-04-05 02:11:27,409 - Check-System - INFO - Module installed and loaded
2025-04-05 02:11:27,409 - Check-System - INFO - Checking library torchvision
2025-04-05 02:11:27,409 - Check-System - INFO - Module installed and loaded
2025-04-05 02:11:27,409 - Check-System - INFO - Checking library pandas
2025-04-05 02:11:27,409 - Check-System - INFO - Module installed and loaded
2025-04-05 02:11:27,409 - Check-System - INFO - Checking library numpy
2025-04-05 02:11:27,410 - Check-System - INFO - Module installed and loaded
2025-04-05 02:11:27,410 - Check-System - INFO - Checking library PIL
2025-04-05 02:11:27,410 - Check-System - INFO - Module installed and loaded
2025-04-05 02:11:27,410 - Check-System - INFO - Checking library uuid
2025-04-05 02:11:27,410 - Check-System - INFO - Module installed and loaded
2025-04-05 02:11:27,410 - Check-System - INFO - Checking library shapely
2025-04-05 02:11:27,410 - Check-System - INFO - Module installed and loaded
2025-04-05 02:11:27,410 - Check-System - INFO - Checking library ujson
2025-04-05 02:11:27,410 - Check-System - INFO - Module installed and loaded
2025-04-05 02:11:27,410 - Check-System - INFO - Checking library tqdm
2025-04-05 02:11:27,410 - Check-System - INFO - Module installed and loaded
2025-04-05 02:11:27,410 - Check-System - INFO - Checking library snappy
2025-04-05 02:11:27,410 - Check-System - INFO - Module installed and loaded
2025-04-05 02:11:27,410 - Check-System - INFO - Checking library collections
2025-04-05 02:11:27,410 - Check-System - INFO - Module installed and loaded
2025-04-05 02:11:27,410 - Check-System - INFO - Checking library einops
2025-04-05 02:11:27,411 - Check-System - INFO - Module installed and loaded
2025-04-05 02:11:27,411 - Check-System - INFO - Checking library scipy
2025-04-05 02:11:27,411 - Check-System - INFO - Module installed and loaded
2025-04-05 02:11:27,411 - Check-System - INFO - Checking library skimage
2025-04-05 02:11:27,411 - Check-System - INFO - Module installed and loaded
2025-04-05 02:11:27,411 - Check-System - INFO - Checking library cv2
2025-04-05 02:11:27,411 - Check-System - INFO - Module installed and loaded
2025-04-05 02:11:27,411 - Check-System - INFO - Checking library functools
2025-04-05 02:11:27,411 - Check-System - INFO - Module installed and loaded
2025-04-05 02:11:27,411 - Check-System - INFO - Checking library dataclasses
2025-04-05 02:11:27,411 - Check-System - INFO - Module installed and loaded
2025-04-05 02:11:27,411 - Check-System - INFO - Checking library pathpatch
2025-04-05 02:11:27,411 - Check-System - INFO - Module installed and loaded
2025-04-05 02:11:27,411 - Check-System - INFO - Checking library cellvit.inference.cli
2025-04-05 02:11:27,412 - Check-System - INFO - Module installed and loaded
2025-04-05 02:11:27,412 - Check-System - INFO - Checking library cellvit.inference.inference
2025-04-05 02:11:27,412 - Check-System - INFO - Module installed and loaded

```

***** System *****

```

2025-04-05 02:11:27,416 - Check-System - INFO - Environment: vm
2025-04-05 02:11:27,416 - Check-System - INFO - Available cores: 12
2025-04-05 02:11:27,416 - Check-System - INFO - Available memory: 83.47704696655273 (GB)
2025-04-05 02:11:27,416 - Check-System - INFO - Checking GPU availability...
2025-04-05 02:11:29,136 - Check-System - INFO - CUDA-capable GPU detected.
2025-04-05 02:11:29,136 - Check-System - INFO - CUDNN Version: 90100
2025-04-05 02:11:29,137 - Check-System - INFO - Number of CUDA Devices: 1
2025-04-05 02:11:29,137 - Check-System - INFO - CUDA Device 0 Name: NVIDIA A100-SXM4-40GB

```

Mount Google Drive

```

from google.colab import drive
drive.mount('/content/drive')

```

↗ Drive already mounted at /content/drive; to attempt to forcibly remount, call drive.mount("/content/drive", force_remount=True)

```

import openslide
import glob

```

Path where your .svs files are

```
svs_folder = '/content/drive/MyDrive/CellViT/H&E_Svs/'
```

Find all .svs files

```
svs_files = glob.glob(svs_folder + '*.svs')
```

```
print(f"Found {len(svs_files)} SVS files to check.\n")
```

Check each file

for file in svs_files:

try:

```

    slide = openslide.OpenSlide(file)
    properties = slide.properties
    print(f"{file} -- OK")

```

except Exception as e:

```
    print(f"{file} -- BROKEN: {e}")
```

↗ Found 8 SVS files to check.

```

/content/drive/MyDrive/CellVIT/H&E_Svs/ss12084_1_4_090801.svs -- OK
/content/drive/MyDrive/CellVIT/H&E_Svs/ss12084_1_5_090909.svs -- OK
/content/drive/MyDrive/CellVIT/H&E_Svs/ss12084_1_6_091008.svs -- OK
/content/drive/MyDrive/CellVIT/H&E_Svs/ss12084_1_7_091102.svs -- OK
/content/drive/MyDrive/CellVIT/H&E_Svs/ss12084_1_8_091206.svs -- OK
/content/drive/MyDrive/CellVIT/H&E_Svs/ss12084_1_1_090448.svs -- BROKEN: Unsupported or missing image file
/content/drive/MyDrive/CellVIT/H&E_Svs/ss12084_1_2_090548.svs -- BROKEN: Unsupported or missing image file
/content/drive/MyDrive/CellVIT/H&E_Svs/ss12084_1_3_090657.svs -- BROKEN: Unsupported or missing image file

```

```

!cellvit-inference \
--model HIPT \
--outdir "/content/drive/MyDrive/CellVIT/results_svs/ss12084_1_1_090448" \
--cpu_count 16 \
--ray_worker 4 \
--ray_remote_cpus 2 \
--enforce_amp \
--batch_size 16 \
--debug \
--geojson \
process_wsi \
--wsi_path "/content/drive/MyDrive/CellVIT/H&E_Svs/ss12084_1_1_090448.svs" \
--wsi_mpp 0.25 \
--wsi_magnification 40

```

 [Show hidden output](#)

```

!cellvit-inference \
--model HIPT \
--outdir "/content/drive/MyDrive/CellVIT/results_svs/ss12084_1_2_090548" \
--cpu_count 16 \
--ray_worker 4 \
--ray_remote_cpus 2 \
--enforce_amp \
--batch_size 16 \
--debug \
--geojson \
process_wsi \
--wsi_path "/content/drive/MyDrive/CellVIT/H&E_Svs/ss12084_1_2_090548.svs" \
--wsi_mpp 0.25 \
--wsi_magnification 40

```

 [Show hidden output](#)

```

!cellvit-inference \
--model HIPT \
--outdir "/content/drive/MyDrive/CellVIT/results_svs/ss12084_1_3_090657" \
--cpu_count 16 \
--ray_worker 4 \
--ray_remote_cpus 2 \
--enforce_amp \
--batch_size 16 \
--debug \
--geojson \
process_wsi \
--wsi_path "/content/drive/MyDrive/CellVIT/H&E_Svs/ss12084_1_3_090657.svs" \
--wsi_mpp 0.25 \
--wsi_magnification 40

```

 [Show hidden output](#)

```

!cellvit-inference \
--model HIPT \
--outdir "/content/drive/MyDrive/CellVIT/results_svs/ss12084_1_4_090801" \
--cpu_count 16 \
--ray_worker 4 \
--ray_remote_cpus 2 \
--enforce_amp \
--batch_size 16 \
--debug \
--geojson \
process_wsi \
--wsi_path "/content/drive/MyDrive/CellVIT/H&E_Svs/ss12084_1_4_090801.svs" \

```

```
--wsi_mpp 0.25 \  
--wsi_magnification 40
```

 [Show hidden output](#)

```
!cellvit-inference \  
--model HIPT \  
--outdir "/content/drive/MyDrive/CellVIT/results_svs/ss12084_1_5_090909" \  
--cpu_count 16 \  
--ray_worker 4 \  
--ray_remote_cpus 2 \  
--enforce_amp \  
--batch_size 16 \  
--debug \  
--geojson \  
process_wsi \  
--wsi_path "/content/drive/MyDrive/CellVIT/H&E_Svs/ss12084_1_5_090909.svs" \  
--wsi_mpp 0.25 \  
--wsi_magnification 40
```

 [Show hidden output](#)

```
!cellvit-inference \  
--model HIPT \  
--outdir "/content/drive/MyDrive/CellVIT/results_svs/ss12084_1_6_091008" \  
--cpu_count 16 \  
--ray_worker 4 \  
--ray_remote_cpus 2 \  
--enforce_amp \  
--batch_size 16 \  
--debug \  
--geojson \  
process_wsi \  
--wsi_path "/content/drive/MyDrive/CellVIT/H&E_Svs/ss12084_1_6_091008.svs" \  
--wsi_mpp 0.25 \  
--wsi_magnification 40
```

 [Show hidden output](#)

```
!cellvit-inference \  
--model HIPT \  
--outdir "/content/drive/MyDrive/CellVIT/results_svs/ss12084_1_7_091102" \  
--cpu_count 16 \  
--ray_worker 4 \  
--ray_remote_cpus 2 \  
--enforce_amp \  
--batch_size 16 \  
--debug \  
--geojson \  
process_wsi \  
--wsi_path "/content/drive/MyDrive/CellVIT/H&E_Svs/ss12084_1_7_091102.svs" \  
--wsi_mpp 0.25 \  
--wsi_magnification 40
```

 [Show hidden output](#)

```
!cellvit-inference \  
--model HIPT \  
--outdir "/content/drive/MyDrive/CellVIT/results_svs/ss12084_1_8_091206" \  
--cpu_count 16 \  
--ray_worker 4 \  
--ray_remote_cpus 2 \  
--enforce_amp \  
--batch_size 16 \  
--debug \  
--geojson \  
process_wsi \  
--wsi_path "/content/drive/MyDrive/CellVIT/H&E_Svs/ss12084_1_8_091206.svs" \  
--wsi_mpp 0.25 \  
--wsi_magnification 40
```

```
--wsi_magnification 40
```

[Show hidden output](#)

Start coding or [generate](#) with AI.