

Final Assignment: Beyond Peak Performance

5LSM0: Neural Networks for Computer Vision

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Overview

- Part – 1: Get a good baseline model op CityScapes
- Part – 2: Go beyond peak performance
- 50% of your final grade! (70 hours!)
- [5LSM0 Cityscapes competition!](#)



Everyone

Competition Benchmarks

Peak Performance

- Open for submissions!
- Get the highest segmentation score

Robustness

- Open for submissions!
- Get the highest segmentation score on harder dataset

Efficiency

- Open for submissions!
- Get a good performance with a small model

Out-of-distribution

- Open for submissions!
- Give your model the option to tell the user it is unsure about the prediction

Choose 1 of the 3

The 5LSM0 competition (2025)

Organized by competition_5lsm0 - Current server time: March 14, 2025, 10:38 a.m. UTC

► Current

Next

End

Baseline

Peak Performance

Competition Ends

Jan. 3, 2025, midnight UTC

March 19, 2025, midnight UTC

June 20, 2025, midnight UTC

Learn the Details

Phases

Participate

Results

Get Data

Files

Submit / View Results

Baseline

Peak Performance

Robustness

Efficiency

Out-of-distribution

Phase description

Establish a functional pipeline and verify your model's segmentation accuracy on a clean test set to ensure you're on the right track.

Max submissions per day: 1

Max submissions total: 100

Max Submission Size: 300 megabyte(s)

Click the Submit button to upload a new submission.

Optionally add more information about this submission

Submit

Here are your submissions to date (✓ indicates submission on leaderboard):

#	SCORE	FILENAME	SUBMISSION DATE	SIZE (BYTES)	STATUS	✓
No data available in table						

Select the right benchmark

Keep track of submissions for comparison later: Model, training parameters ect.

Robustness

- Sometimes your model will face ‘harder’ images
- Make your model more robust against lesser image quality
- Make your model more robust against different situations
- **Metric: Dice score**

Fog



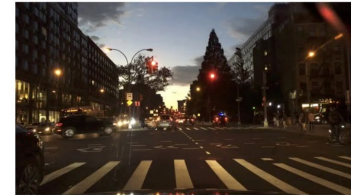
Rain



Snow



Night



Exotic City

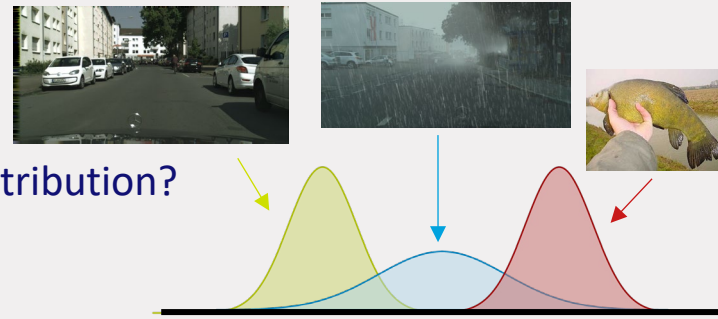


Low light



- olution, **otherwise metric = 0**

Out-of-distribution



- What happens when the model sees an image out of distribution?
- It will still give a segmentation output
- Do we want this? Should we rather have the model alarm us that it is not certain about the prediction?
- Test set: **In-distribution** data, **near-out-of-distribution** data, **far out-of-distribution** data
- **Metric: Dice score on all included images**
 1. Your model has the option to excluded OOD images -> **Good**, mean dice score will not be affected
 2. If your model includes OOD images -> **Bad**, dice = 0 for that image, mean dice score will decrease
 3. If your model excluded ID images -> **Bad**, dice = 0 for that image, mean dice score will decrease

Bonus

- For each benchmark you can get bonus point on your final assignment grade!
 - Winner: +0.5
 - Top 3: +0.25
- Example: You win the 'peak performance' benchmark and you become 2nd in the Robustness benchmark. Bonus = +0.75
- While achieving high rankings on the competition leaderboards is nice, **it's essential to remember that this is still a research project.** Formulating a research question, thoroughly understand the challenges at hand, and come up with innovative solutions are paramount.

Deliverables (exact details on Canvas)

1. 4-page IEEE format research paper
2. The research question you try to answer should of course focus on one of the three benchmark
3. Public GitHub repository with all code
4. At least one working solution on the “Peak performance” benchmark and 1 other benchmark. Of course, you can also submit on multiple benchmarks!

Tips

- **Start early!** Since working with a HPC will be new to most students we will offer as much guidance as need. However, this will only work if you start well on time with the assignment.
- Check [Weights and Biases](#) for model training logging!
- **Try to define a good baseline for comparison!** This will be your starting point and improvements need to be compared against this baseline implementation
- While achieving high rankings on the competition leaderboards is nice, **it's essential to remember that this is still a research project.** Formulating a research question, thoroughly understand the challenges at hand, and come up with innovative solutions are paramount.