Visual Recognition using Deep Learning
2025 Spring, Final Project

Release Date: 2025/04/30 12:00

Final Project - Join a Public Kaggle Competition

- Presentation: 05/28, 06/04 (Wed)
- **Team List**
- **Join the selected competition and chase the best performance**
- **Make a 12 mins presentation (10 mins + 2 mins Q&A)**
- **Upload the report (+codes) and slides by team**
  - **3 days before the presentation (e.g., 5/26 23:59 for 5/28) [late penalty: 20/day]**
  - **Presentation can be updated; Report cannot be updated.**
  - **Report & Code → Upload to E3 by team leader**
- **Grade your teammate**

Selected Competitions on Kaggle
(Align with presentation order)

1. Cassava Leaf Disease Classification (Classification)
2. Global Wheat Detection (Detection)
3. Prostate cANcer graDe Assessment (PANDA) Challenge (Classification)
4. NOAA Fisheries Steller Sea Lion Population Count (Detection)
5. Sartorius - Cell Instance Segmentation (Instance Segmentation)
6. Super Resolution in Video Games (Super Resolution)
7. Image Matching Challenge 2023 (3D reconstruction)

Grading Policy

- Model Performance (50%)
  - Weak baseline - Get the golden medal rank: 25 pts
  - Strong baseline - Achieve top-3 rank: 40 pts
  - >= (Top-1 performance + (2 - 5)%, or best score * [1.02 - 1.05]): 50 pts
    - Classification: 5% / Detection and Instance Seg: 3% / SuperRes and 3D: 2%
- Presentation (30%)
  - Completeness
  - Innovation
  - Organization
  - etc.
- Reports & Code (10%)
- Within-Group Peer Review (10%)

Competition Medals

Competition medals are awarded for top competition results. The number of medals awarded per competition varies depending on the size of the competition. Note that InClass, playground, and getting started competitions do not award medals.

	0-99 Teams	100-249 Teams	250-999 Teams	1000+ Teams
Bronze	Top 40%	Top 40%	Top 100	Top 10%
Silver	Top 20%	Top 20%	Top 50	Top 5%
Gold	Top 10%	Top 10	Top 10 + 0.2%*	Top 10 + 0.2%*

For each competition, check the score to achieve golden medal on the leaderboard!

	Score	Entries	Last	Solution
	0.9132	131	4y	
	0.9043	3	4y	
	0.9028	244	4y	

Most best solution can be found, try to replicate and combine those solutions to beat them

1. Cassava Leaf Disease Classification (Classification)

Cassava Leaf Disease Classification

Identify the type of disease present on a Cassava Leaf image

History

- # Participated Teams: 3,900
- Golden metal score: 0.9013 – 0.9132 (best)

Info

- Dataset size: 6.19 GB
- Evaluation metric: Accuracy
- #Teams can select this topic: 4

Label 0: Cassava Bacterial Blight (CBB)

Label 1: Cassava Brown Streak Disease (CBSD)

Label 2: Cassava Green Mottle (CGM)

2. Global Wheat Detection (Object Detection)

Global Wheat Detection

Can you help identify wheat heads using image analysis?

History

- # Participated Teams: 2,245
- Golden metal score: 0.6708 – 0.6897 (best)

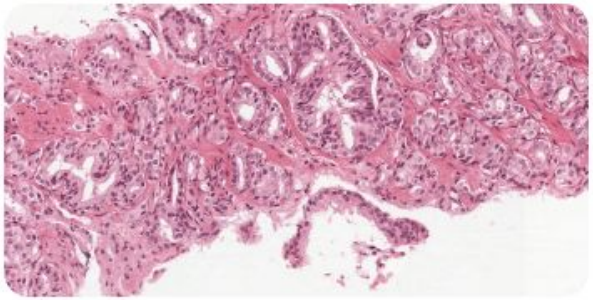
Info

- Dataset size: 643.57 MB
- Evaluation metric: mean Average Precision
- #Teams can select this topic: 4

3. Prostate cANcer graDe Assessment (PANDA) Challenge
(Classification)

Prostate cANcer graDe Assessment (PANDA) Challenge

Prostate cancer diagnosis using the Gleason grading system



History

- # Participated Teams: 1,010
- Golden metal score: 0.92960 – 0.94085 (best)

Info

- Dataset size: 411.9 GB
- Evaluation metric: quadratic weighted kappa
- #Teams can select this topic: 4

4. NOAA Fisheries Steller Sea Lion Population Count

(Detection)

NOAA Fisheries Steller Sea Lion Population Count

How many sea lions do you see?

History

- # Participated Teams: 385
- Golden metal score: 15.88 – 10.85 (best)

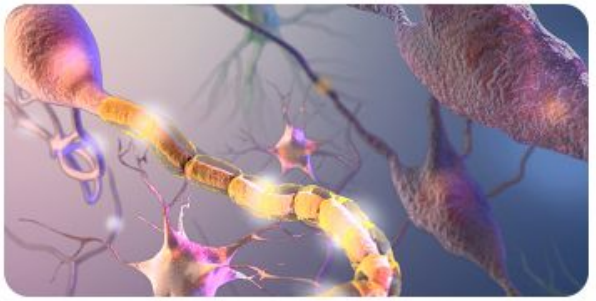
Info

- Dataset size: 103.01 GB
- Evaluation metric: RMSE
- #Teams can select this topic: 4

5. Sartorius - Cell Instance Segmentation (Instance Seg)

Sartorius - Cell Instance Segmentation

Detect single neuronal cells in microscopy images



History

- # Participated Teams: 1,505
- Golden metal score: 0.347 – 0.356 (best)

Info

- Dataset size: 3.83 GB
- Evaluation metric: mean Average Precision
- #Teams can select this topic: 4

6. Super Resolution in Video Games (Super Resolution)

Super Resolution in Video Games

Try to train the SR model on a custom gaming dataset collected using Unreal Engine

History

- # Participated Teams: 38
- Golden metal score: 33.80 (Best)

Info

- Dataset size: 51.4 GB
- Evaluation metric: PSNR
- #Teams can select this topic: 4

7. Image Matching Challenge 2023 (3D reconstruction)

Image Matching Challenge 2023

Reconstruct 3D scenes from 2D images

History

- # Participated Teams: 495
- Golden metal score: 0.570 (Best)

Info

- Dataset size: 12.64 GB
- Evaluation metric: mean Average Accuracy (mAA)
- #Teams can select this topic: 4

Important Dates

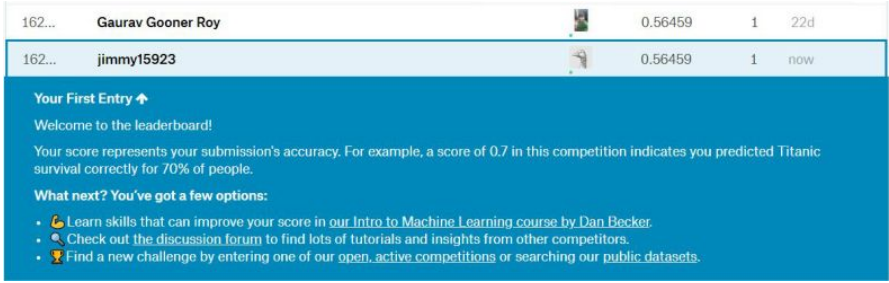
Event	Date	Note
Select Topic/Competition	04/30 (Wed) - 05/06 (Tue)	Fill out the competition selection form **by team leader** **First comes, first served!** After you submit the form, **we'll email to the team leader your team's assigned topic within 2 days**.
Final Presentation I	05/28 (Wed)	1. Cassava Leaf Disease Classification 2. Global Wheat Detection 3. Prostate cANcer graDe Assessment (PANDA) Challenge
Final Presentation II	06/04 (Wed)	4. NOAA Fisheries Steller Sea Lion Population Count 5. Sartorius - Cell Instance Segmentation 6. Super Resolution in Video Games 7. Image Matching Challenge 2023

- Link to the competition selection form (login required)
- You **CANNOT** change topic after submitting / being assigned, pick up topic early and carefully.
- After 05/06, we will assign a topic for you if no your team haven't fill the form.

About the report and presentation

Presentation should contain the following sections / contents

- Introduction
- Related works
- Method / Approach
- Experimental Results
- Conclusion
- Reference



Also, don't forget to screen shot your rank in the report/presentation

Good Luck!