

DTU



Multi-modal Fungi Challenge 2025

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 - Develop an algorithm to classify images of fungi into 183 different species classes



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 - Develop an algorithm to classify images of fungi into 183 different species classes
- The fungi dataset does not only include images, but also metadata!
 - **Time (Seasonality):** Fungi are seasonal performers, sprouting in specific months.
 - **Location (Latitude and Longitude):** Where a fungus grows can often narrow down its identity, providing geographical hints specific to Denmark's ecosystems.
 - **Habitat:** A mushroom growing in dense, moist forests isn't quite the same as one flourishing in open meadows—habitat descriptions matter!
 - **Substrate:** What it grows on (tree stumps, soil, sand) is sometimes the biggest hint of all.
- *How do you learn to classify fungi from a combination of images and metadata?*

What are you supposed to do?



- Achieve the highest F1 score by predicting the true species label of fungi
- Implement different multimodal learning strategies including different ways of using the given metadata
- Find the set of metadata that gives the largest improvement in classification F1 scores
- We provide a basic image classification network
- You should:
 - Train and evaluate the classification network using the available data
 - Find a strategy for learning from multiple data types and how to integrate metadata in your model
 - Choose what metadata you want to buy and how much
 - Achieve your best test score following your strategy

Why is this relevant?

- Metadata can improve classification performance - given the metadata is relevant for the task at hand
- You can pay a domain expert to label metadata
 - But it has a cost per image
- Fungi classification is a crucial task!

Surge in death cap mushrooms in NSW and SA as scientists warn some deadly fungi look like supermarket varieties

Amanita phalloides detected growing in Sydney, the southern highlands, southern NSW and the Adelaide hills



Killer fungi detectives: inside the lab that may be fighting the next pandemic

Researchers in Adelaide are at the forefront of finding new fungal pathogens, which are spreading more because of climate change and can be deadly without effective drugs

20 Feb 2024 15.00 CET | 19

11 hospitalized in Pennsylvania after eating wild mushrooms

A man, a woman and nine children were taken to hospital after they ate the toxic fungi, a fire agency said.

Ohio man nearly dies after eating poisonous mushroom found on his lawn

Experts warn to be careful when foraging mushrooms

Australian woman guilty of murdering relatives with toxic mushroom meal

7 July 2025

Tiffanie Turnbull
in Morwell, Australia

Share Save



Oct. 14, 2024, 6:32 AM GMT+2
By Dennis Romero

Mushroom-growing boom could cause biodiversity crisis, warn UK experts

RHS fears non-native fungi could alter microbiology of soil in gardens or disposed of in compost heaps

Prof Arturo Casadevall: 'It is hubris to think a fungal pandemic can't happen to us'

Could a fungus trigger a Last of Us-style apocalypse? The author of *What If Fungi Win?* says despite dangers, the organisms are of great use to science

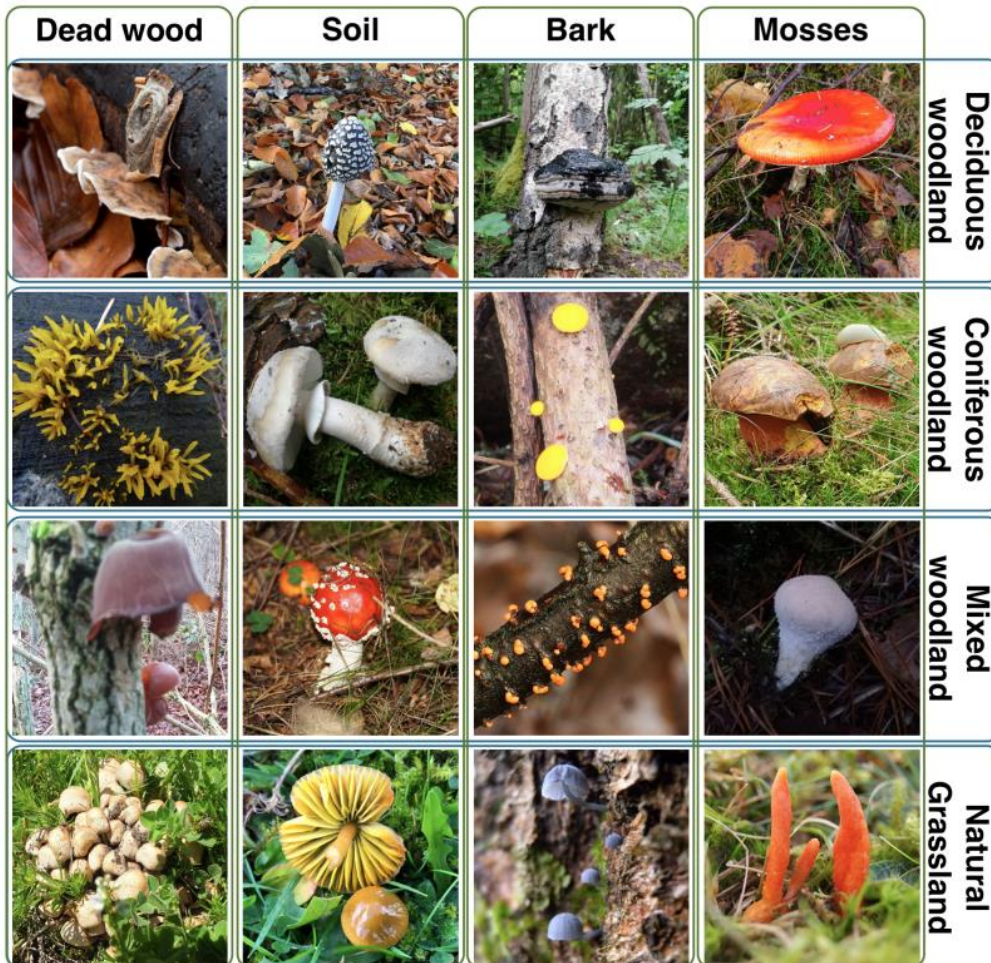


Data – Fungi images



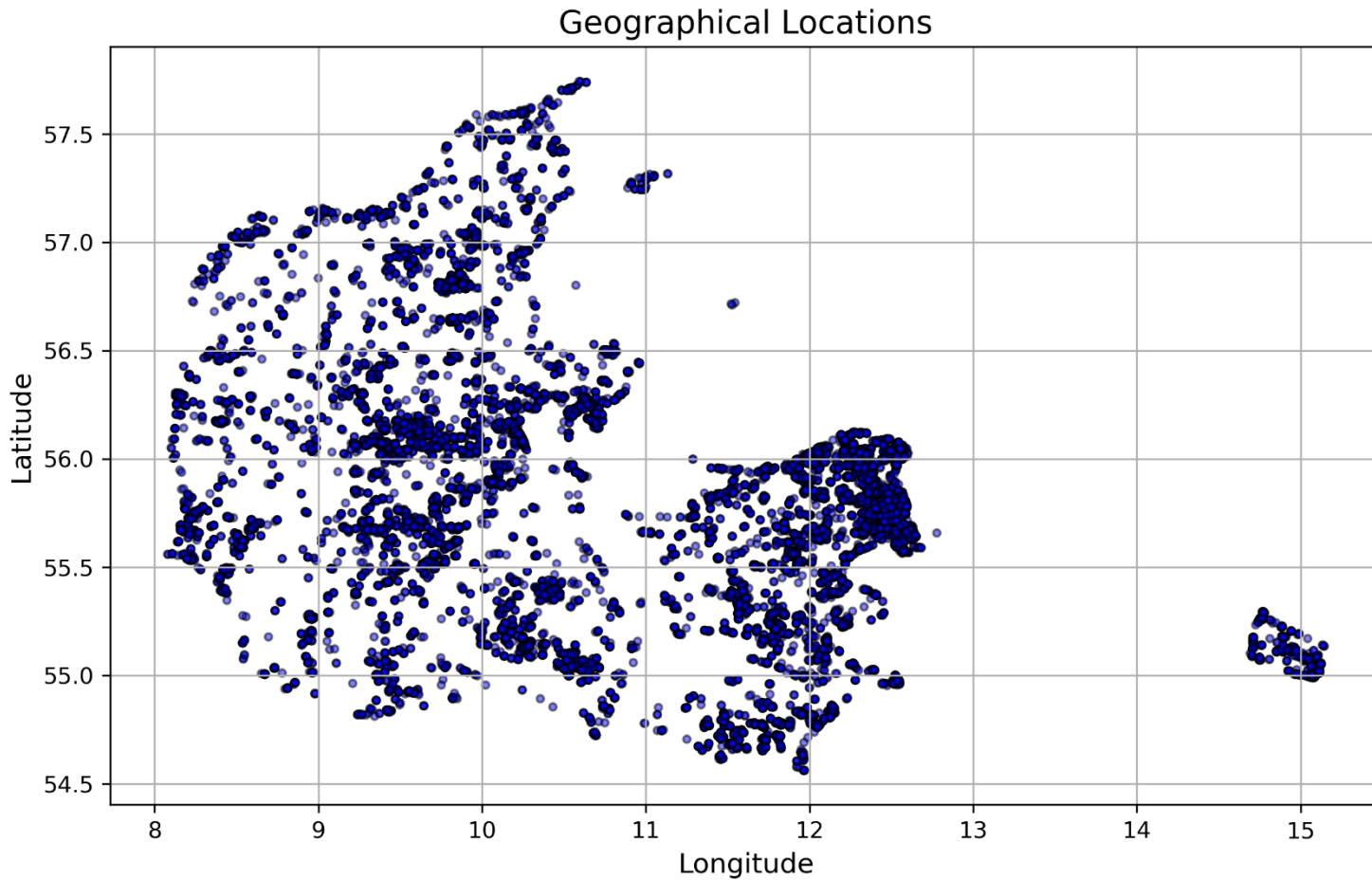
- The goal is to classify fungi by their species – in this set called the taxonID.
- There are 183 different species in the set
- Highly unbalanced
- Typical classification accuracies is in the range of 55-75

Data - Metadata



- **Habitat (rows):** Overall environment where the fungi grow. The dataset includes 32 habitats
- **Substrate (columns):** A surface or material on which the fungi live. The dataset includes 32 substrate types.

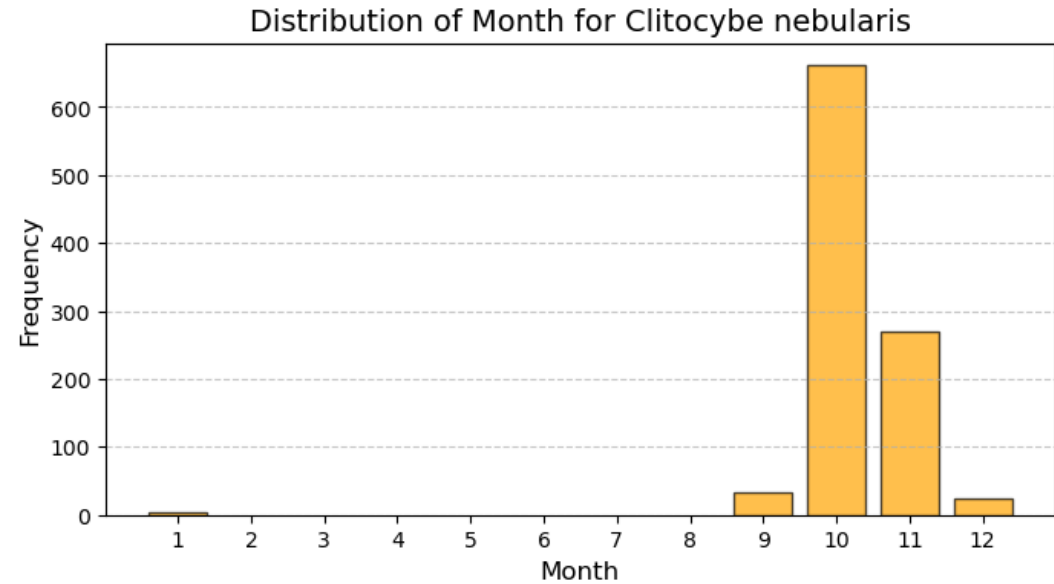
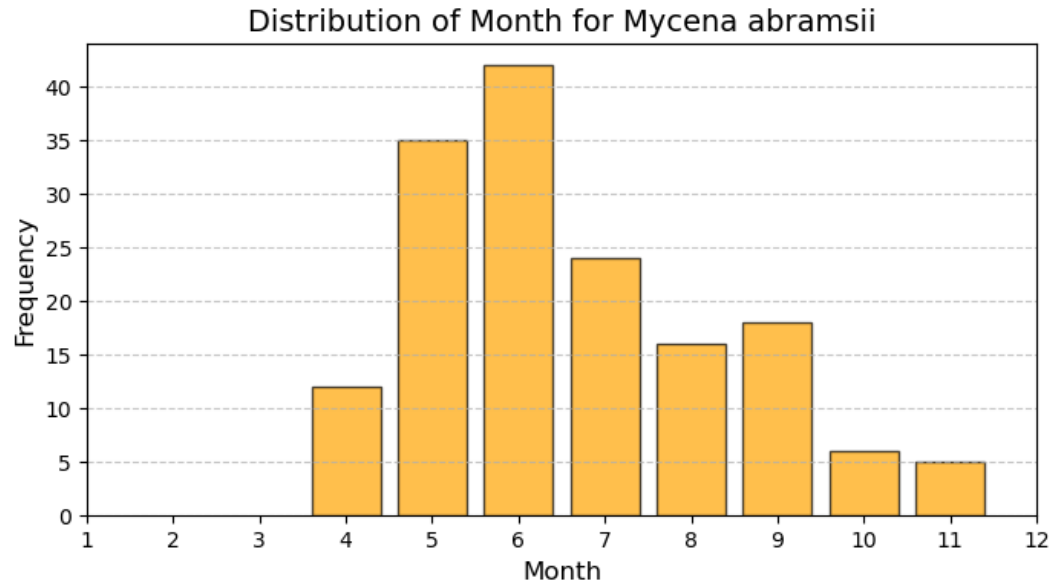
Data - Metadata



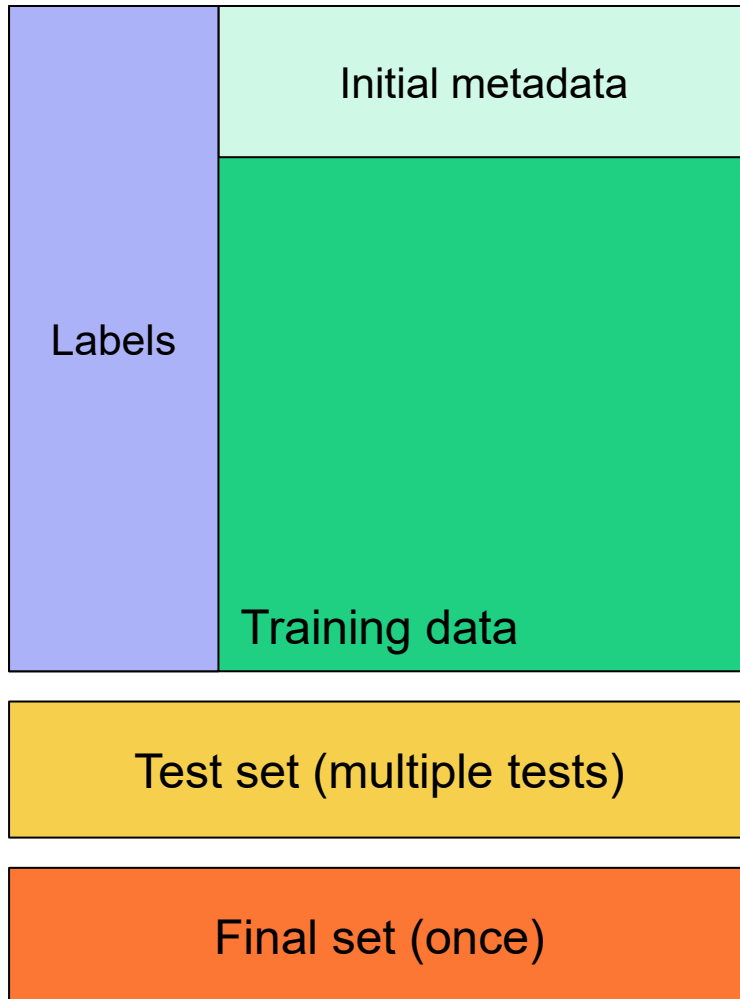
- ***Location:*** latitude and longitude of where the picture is taken

Data - Metadata

- ***Time-stamp***: When the fungi was observed



Data



Training set

- Total of 25863 images
- The label (taxonID_index) is given
- You can buy metadata for this set (some is available at the start of the challenge).

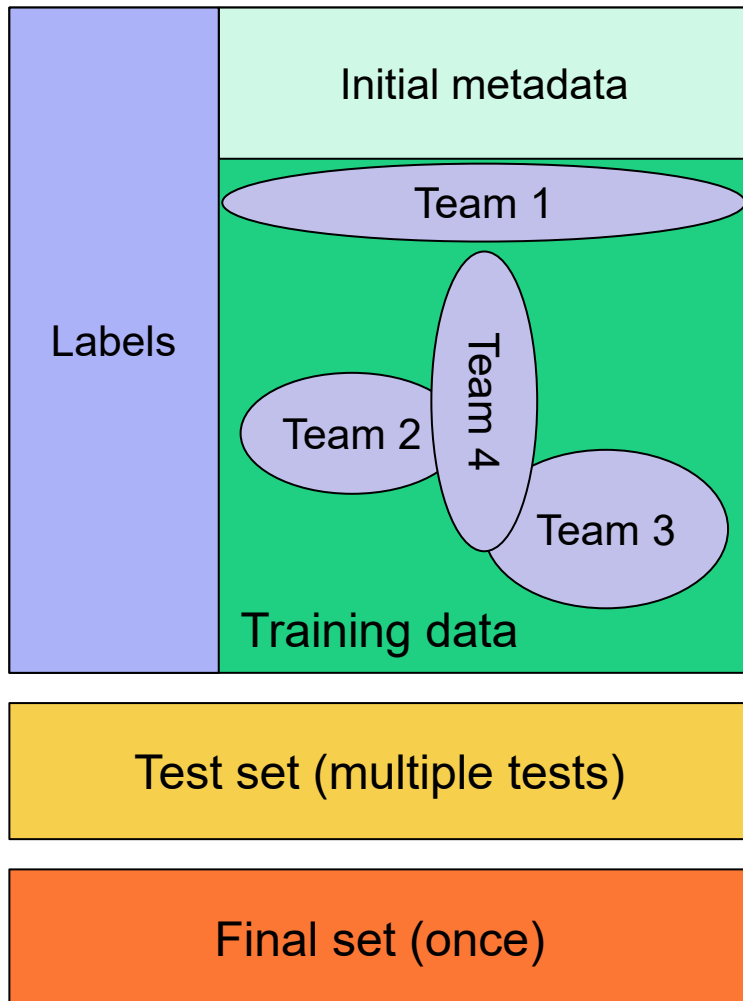
Test set

- Total of 6552 images
- Used for team scores during the challenge
- All metadata is available, and the true label should be predicted.

Final set

- Total of 3600 images
- Used to compute the final challenge score
- All metadata is available, and true label should be predicted

Conceptual idea



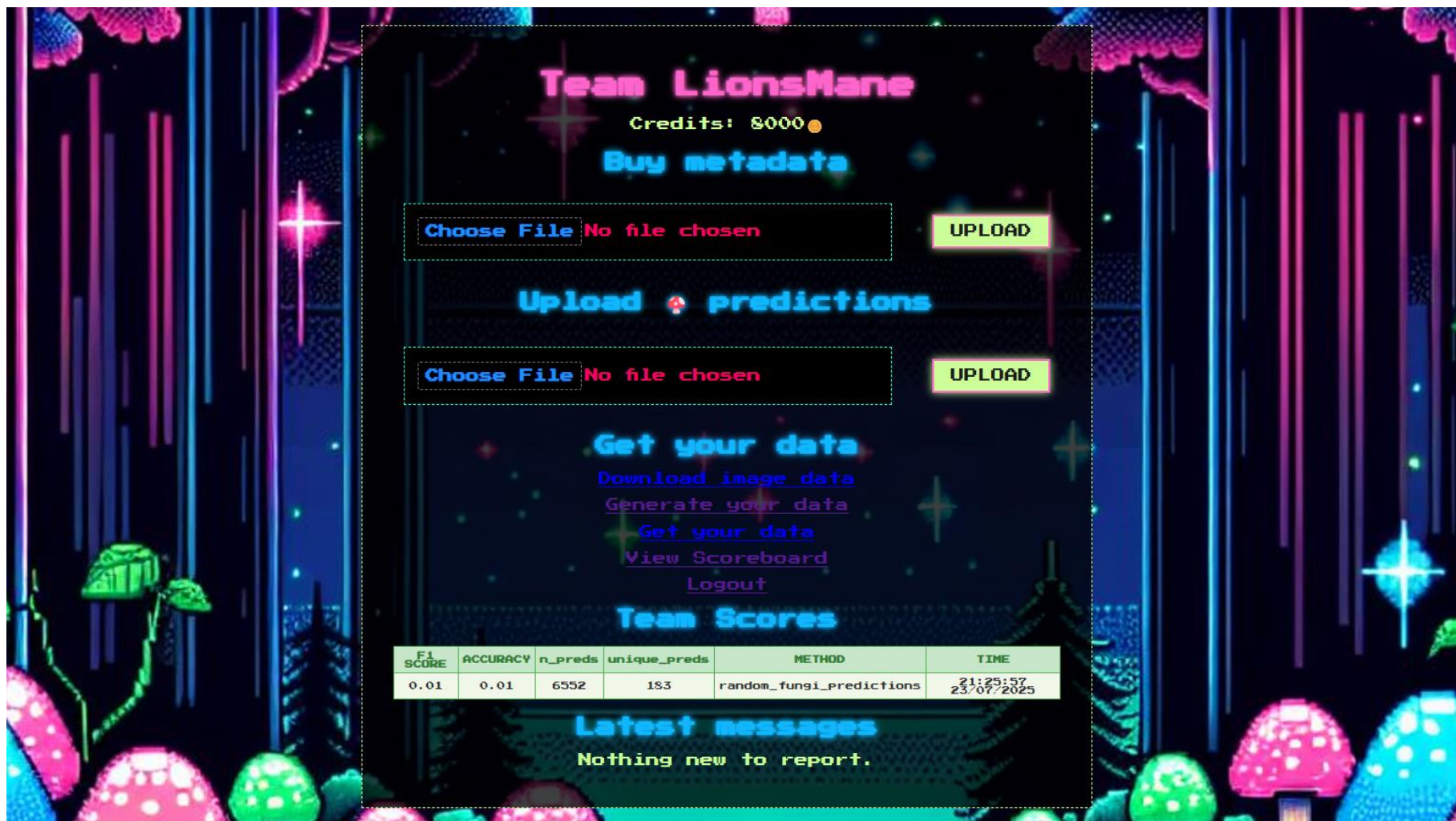
- What subset of the total metadata set will give the highest classification scores on the test and final set?
- You will get small amount of metadata to start out, and then you can buy more
- Each team starts with 20.000 credits, and during the challenge you will get additional 10.000 credits every 12h
- Buying the metadata has the following costs:
 - eventDate : 2 credits
 - Latitude : 1 credit
 - Longitude : 1 credit
 - Habitat : 2 credits
 - Substrate : 2 credits

Teams



- You should participate in the challenge in teams of 4-7 people
- We have pre-made 15 team names
- You should add your name and email to a team on the paper in the conference room
- Each team should have at least one computer with a reasonable GPU or access to a GPU cluster

Challenge dashboard



Team LionsMane
Credits: 8000 ●

Buy metadata

Choose File No file chosen **UPLOAD**

Upload 🍄 predictions

Choose File No file chosen **UPLOAD**

Get your data
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Team Scores

F1 SCORE	ACCURACY	n_preds	unique_preds	METHOD	TIME
0.01	0.01	6552	153	random_fungi_predictions	21:29:57 23/07/2025

Latest messages
Nothing new to report.

Challenge results



Fungi Scoreboard

TEAM	F1 SCORE	ACCURACY	METHOD	CREDITS SPENT	TIME
LionsMane	0.54	0.55	class_weighted_loss	0	12:03:42 31/07/2025
LionsMane	0.54	0.55	trial	0	13:50:55 30/07/2025
LionsMane	0.50	0.49	class_weighted_loss	0	09:09:20 31/07/2025
LionsMane	0.01	0.01	random_fungi_predictions	0	21:25:57 23/07/2025
Puffballs	0.01	0.01	random_fungi_predictions	0	21:23:11 23/07/2025
Puffballs	0.01	0.01	random_fungi_predictions	0	21:22:36 23/07/2025
Puffballs	0.01	0.01	random_fungi_predictions	0	21:22:47 24/07/2025
Puffballs	0.01	0.01	random_fungi_predictions	0	21:23:59 24/07/2025
Puffballs	0.01	0.00	random_fungi_predictions	0	21:17:25 23/07/2025
Puffballs	0.01	0.00	random_fungi_predictions	0	19:01:42 24/07/2025
Puffballs	0.01	0.00	random_fungi_predictions	3203	23:27:30 01/08/2025
Stinkhorns	0.00	0.00	random_fungi_predictions	0	21:25:36 23/07/2025
Puffballs	0.00	0.00	fungi_train000000.jpg.Habitat	3203	23:28:00 01/08/2025

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[Team dashboard](#)

- All test evaluations are done on the challenge website
- You should submit test scores AT LEAST once per day
- You should also submit the final set scores latest Thursday at 16h!

Presentations and results

- The final project presentations and results are on Thursday from 16:30-18:00
- Each team has 4 minutes to present their project with maximum 3 slides
 - How did you design your strategy?
 - Did it work as expected?
 - Etc.
- Finally, the final test results are presented by the organizers



Tips

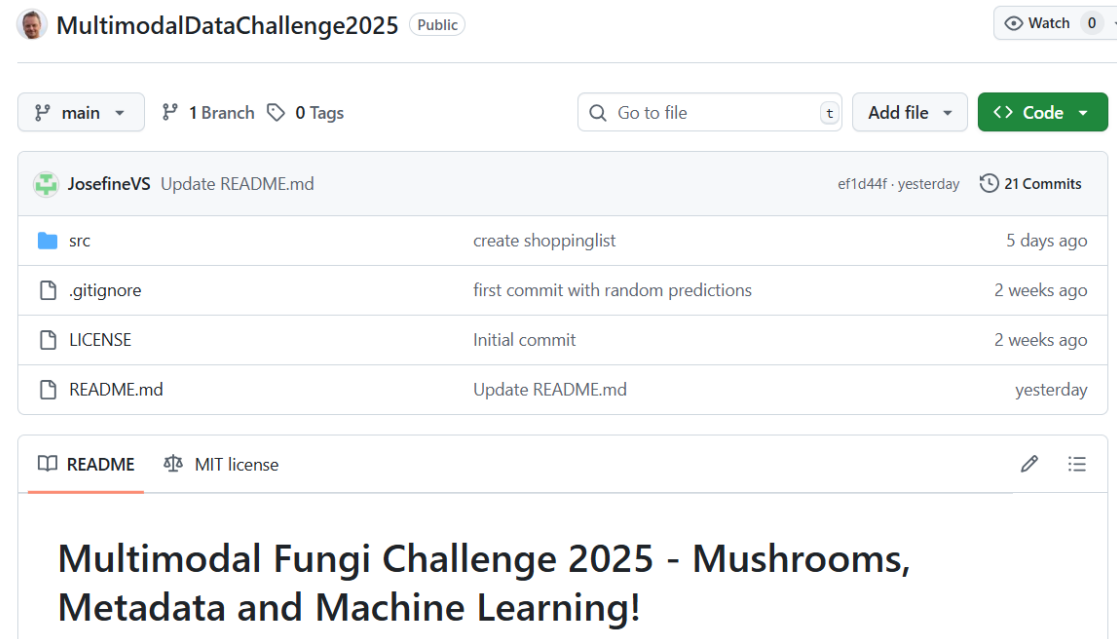
- Divide your data into a training and validation set (check for overfit etc)
- Careful with your credits
 - Make a strategy before spending them
- Start by exploring the available metadata in the training set, and try to figure out which type of metadata has the most predictive power
- Look at class imbalance when buying metadata

Rules

- We are not checking for cheating and believe in fair play and that you are here to learn
- We do not recommend you to:
 - Get images and labels from external sites
 - Hack or modify the fungichallenge database API functions
 - Use other classification networks
 - The goal is to learn from multiple data sources, and not to optimize a classification network architecture

How do you get started?

- Join a team!
- Go to the summer school website:
 - <https://multi-modal.compute.dtu.dk/talks-materials-and-exercises/>
- Find the link for the Github repo

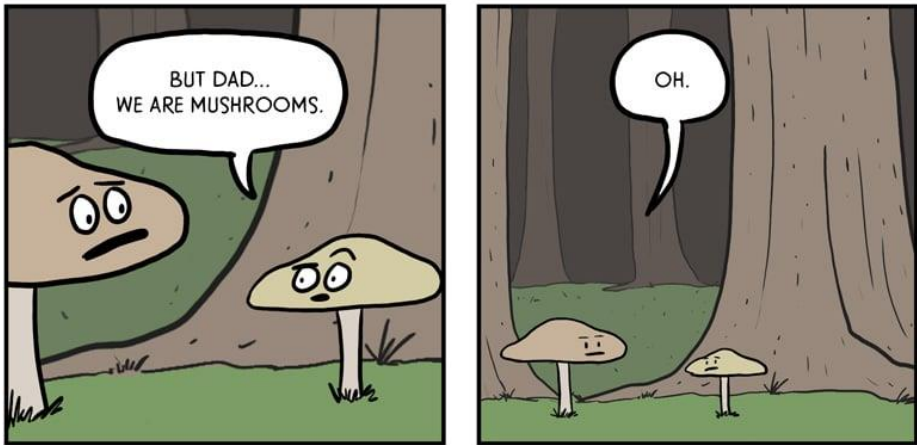


The screenshot shows the GitHub repository page for 'MultimodalDataChallenge2025'. The repository is public and has 1 branch and 0 tags. The main branch is selected. The repository contains a 'src' directory, a '.gitignore' file, a 'LICENSE' file, and a 'README.md' file. The 'README.md' file is the most recent commit, updated yesterday. The repository is owned by 'JosefineVS' and has 21 commits. The repository is licensed under the MIT license. The repository title is 'Multimodal Fungi Challenge 2025 - Mushrooms, Metadata and Machine Learning!'.

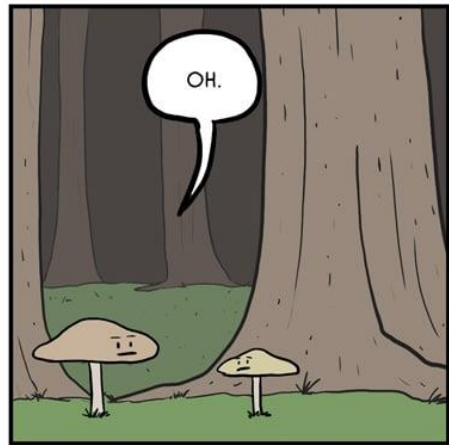
File	Commit Message	Commit Date
src	create shoppinglist	5 days ago
.gitignore	first commit with random predictions	2 weeks ago
LICENSE	Initial commit	2 weeks ago
README.md	Update README.md	yesterday

Multimodal Fungi Challenge 2025 - Mushrooms, Metadata and Machine Learning!

Have fun(gi)!



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BY BRIAN RUSSELL

