WKMLEARN, 2018-04-18 Jean-Olivier Irisson, Martin Schröder, Marc Picheral



ЕсоТаха

A human-computer interface to classify images along a taxonomy with the help of machine-learning







View Help

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Administrative Template

Computer Configuration

Software Settings

Windows Settings

Software Setting

Windows Settings

Control Panel

Shared Folders
Start Menu and Taskbar

Backup

Application Compatibility

Attachment Manage

Deskton Window Manage

Location and Sensors

Network Projecto

Network Sharing Presentation Settings

Remote Desktop Services

Sound Recorder

Windows Calendar Windows Color System

Windows Explore Windows Installe

Windows Anytime Upgrade

Windows Error Reporting

RSS Feeds

Task Scheduler

Search

Tablet PC

Microsoft Management Console

AutoPlay Policies

Desktop Gadgets

Digital Locker

Instant Search

Internet Explorer

NetMeeting

Administrative Templates

User Configuration

Desktop

Network

System
 Windows Components

Setting

Disable Known Folders

Turn off Windows Libraries features that rely on indexed file data

Allow only per user or approved shell extension

Do not track Shell shortcuts during roaming

Remove UI to change menu animation setting

Hide these specified drives in My Computer

Remove File menu from Windows Explorer

Remove Shared Documents from My Computer

Remove the Search the Internet "Search again" link

Remove Search button from Windows Explorer

Turn off numerical sorting in Windows Explorer

Prevent access to drives from My Computer

No Computers Near Me in Network Location

Request credentials for network installations

Maximum allowed Recycle Bin size

Turn off shell protocol protected mode

Turn off Windows+X hotkeys

Remove Windows Explorer's default context menu

Turn off common control and window animation

Do not move deleted files to the Recycle Bin

Do not request alternate credentials

No Entire Network in Network Locations

Maximum number of recent documents

Turn off caching of thumbnail pictures

Remove CD Burning features

Remove DFS tab

Remove Hardware tab

Remove Security tab

Extended Standard)

Turn off the display of snippets in Content view mode

Remove UI to change keyboard navigation indicator setting

Removes the Folder Options menu item from the Tools menu

Hides the Manage item on the Windows Explorer context menu

Remove "Map Network Drive" and "Disconnect Network Drive

Pin Libraries or Search Connectors to the "Search again" links and the Start menu

Pin Internet search sites to the "Search again" links and the Start menu

Prevent users from adding files to the root of their Users Files folder

Turn off display of recent search entries in the Windows Explorer search box

Not

Action

Data management

Streamlining of the user interaction (and in particular the use of machine learning models)

Data accessibility and collaboration

Deno

http://ecotaxa.obs-vlfr.fr

http://ecotaxa.obs-vlfr.fr/prj/859

http://ecotaxa.obs-vlfr.fr/prj/857

http://ecotaxa.obs-vlfr.fr/prj/858

Data model



Data model



Data model



https://unieuk.org





Dataset	Grouping	Random Forest (ZP)	Random Forest (SCN)	Random Forest $(ZP+SCN)$	SparseConvNet
flowcam	group1	82.65%	82.98%	86.64%	69.22%
flowcam	$\operatorname{group}2$	82.56%	83.05%	86.54%	68.15%
uvp5ccelter	group1	85.89%	79.96%	86.70%	52.36%
uvp5ccelter	$\operatorname{group}2$	85.91%	79.74%	86.63%	51.68%
zoocam	group1	87.49%	90.30%	92.16%	88.64%
zoocam	group2	92.74%	93.46%	95.31%	89.85%
zooscan	group1	71.14%	78.90%	79.96%	61.09%
zooscan	group2	70.84%	78.22%	79.62%	60.58%



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uvp5ccelter	group2	85.91%	79.74%	86.63%	51.68%
zoocam	group1	87.49%	90.30%	92.16%	88.64%
zoocam	$\operatorname{group}2$	92.74%	93.46%	95.31%	89.85%
zooscan	group1	71.14%	78.90%	79.96%	61.09%
zooscan	group2	70.84%	78.22%	79.62%	60.58%



Why SparseConvNet?

Sparsity

faster, more efficient

varying input size

Factional Max Pooling

https://www.kaggle.com/c/ datasciencebowl



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National Data Science Bowl

Predict ocean health, one plankton at a time

\$175,000 · 1,049 teams · 3 years ago

Overview Data Discussion Leaderboard Rules

Overview

Description Evaluation Prizes About The Ndsb

Plankton are critically important to our ecosystem, accounting for more than half the primary productivity on earth and nearly half the total carbon fixed in the global carbon cycle. They form the foundation of aquatic food webs including those of large, important fisheries. Loss of plankton populations could result in ecological upheaval as well as negative societal impacts, particularly in indigenous cultures and the developing world. Plankton's global significance makes their population levels an ideal measure of the health of the world's oceans and ecosystems.





Traditional methods for measuring and monitoring plankton populations are time consuming and cannot scale to the granularity or scope necessary for large-scale studies. Improved approaches are needed. One such approach is through the use of an underwater imagery sensor. This towed, underwater camera system captures microscopic, high-resolution images over large study areas. The images can then be analyzed to assess species populations and distributions.

Manual analysis of the imagery is infeasible – it would take a year or more to manually analyze the imagery volume captured in a single day. Automated image classification using machine learning tools is an alternative to the manual approach. Analytics will allow analysis at speeds and scales previously thought impossible. The automated system will have broad applications for assessment of ocean and ecosystem health.

The National Data Science Bowl challenges you to build an algorithm to automate the image identification process. Scientists at the Hatfield Marine Science Center and beyond will use the algorithms you create to study marine food webs, fisheries, ocean conservation, and more. This is your chance to contribute to the health of the world's oceans, one plankton at a time.

Acknowledgements

Booz | Allen | Hamilton 🛛 🚷

kaggle

The National Data Science Bowl is presented by with data provided by the Hatfield Marine Science Center at Oregon State University.

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https://www.kaggle.com/c/ datasciencebowl Evaluation Prizes About The Ndsb Timeline

Tutorial

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Leaderboard

155 discussion topics

1 ≈ Deep Sea ≈

- 2 Happy Lantern Festival
- 3 Poisson Process
- 4 Junonia
- 5 🖞 Deepsea Challenger 🖞
- 6 AuroraXie
- 7 Maxim Milakov
- 8 Ilya Kostrikov

100 discussion topics

Error on submission 2 replies · 2 months ago

z replies · z montins ag

scikit-learn Random Forest memory problem 9 replies · 2 months ago

Code to print out predictions (probs) for Caffe 13 replies · a year ago

Why use logarithm to evaluate results 0 replies · a year ago

CNN + Caffe 12 replies · a year ago

Network structure in SparseConvNet

0:Convolution 2^2x1->4
1:Learn 4->32 VeryLeakyReLU
2:Pseudorandom overlapping Fractional Max Pooling 1.41421 2
... ×12
36:Convolution 2^2x384->1536
37:Learn 1536->416 VeryLeakyReLU
38:TerminalPooling 32 1024
39:Learn 416->448 VeryLeakyReLU
40:Learn 448->93 Softmax Classification

```
Spatially sparse CNN with layer sizes: 1-(TP)-32-(C2)-33-
(POFMP)-47-(C2)-48-(POFMP)-68-(C2)-69-(POFMP)-98-(C2)-99-
(POFMP)-140-(C2)-141-(POFMP)-199-(C2)-200-(POFMP)-283-
(C2)-284-(POFMP)-402-(C2)-403-(POFMP)-570-(C2)-571-
(POFMP)-808-(C2)-809-(POFMP)-1144-(C2)-1145-(POFMP)-1619-
(C2)-1620-(POFMP)-2291-(C2)-2292
Input-field dimensions = 2292x2292
```

Usage statistics (as of today)

50M objects

92k taxa, 1200 actually used

520 projects

10 to 20k classifications/user/day

350 registered users



Usage statistics (as of today)

Sessions 🔻



Usage statistics (as of today)



Future plans for EcoTaxa

Application

Fix our 99 github **issues** ;-)

Add project-level **stats** (who classified, when, how much, etc.)

Centralised taxonomy and user management

Choose a **taxonomy**!

Centralised image browsing (master vs child instances)

UI overhaul

API

Machine learning

Merge classes before training

More classic **framework** (pytorch?)

Generic trained network (ImageNet)

Use **hierarchy** in taxonomy

Unsupervised **clustering** of large/diverse groups

Continuous training and prediction through active learning

+ classification **embedded** on remote devices (0.1W per 3Mpx image)

How?

Various collaborations ongoing

Laboratoire d'Informatique, Signaux et Systèmes de Sophia Antipolis (I3S)

Facebook Artificial Intelligence Research (FAIR)

Google France

SAP

BG7-A call, proposal coordinated by Ketil!



facebook







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