

CS4624 SharkPulse Enhancement

Multimedia, Hypertext, and
Information Access Capstone
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Outline

- Client
- Problem
- Deliverables
- Timeline
- Completed Work
- Challenges
- Acknowledgements
- References

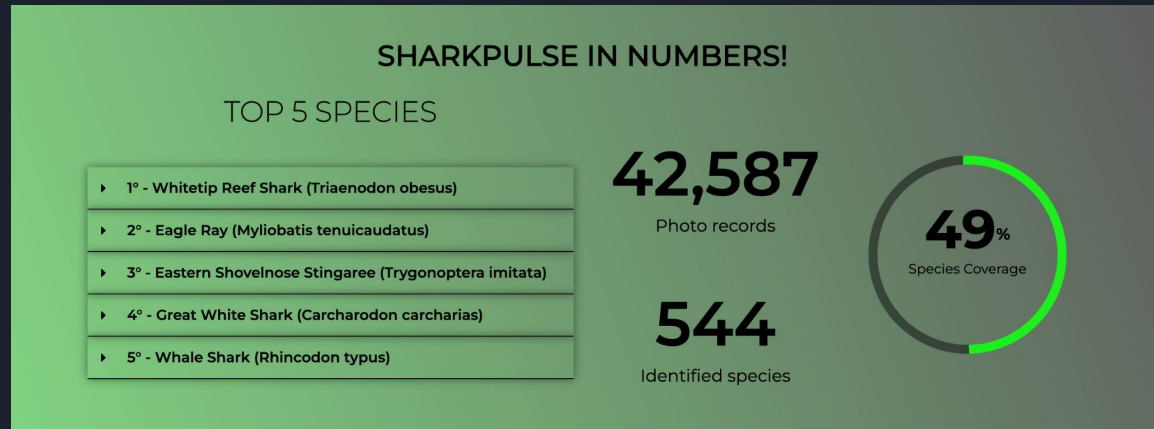


Quick Reminder- Client

- Dr. Francesco Ferretti
- Department of Fish and Wildlife conservation
- Interested in building largest database of online shark sightings

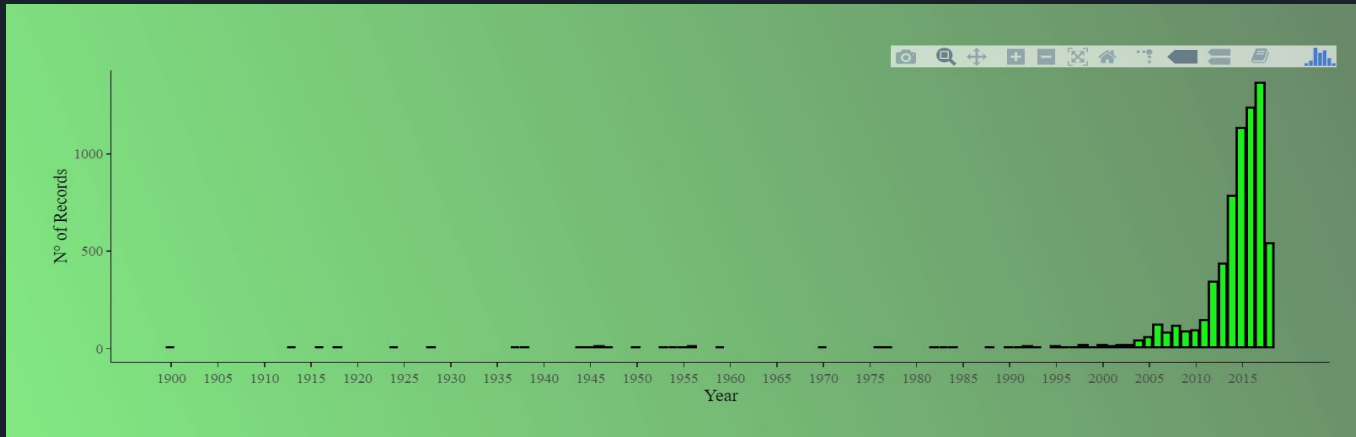
Problems

- Improving/Gamifying validation monitor
- Static Website
- Current shark identification guide



Deliverables

- Dynamic Website
- Improving/Gamifying validation monitor
- Refining the point system for the validation monitor



Example of a figure in the webpage that is not dynamic



Timeline

- February
 - Familiarized ourselves with the codebase and R
- March:
 - Started enhancements on the validation monitor
 - Begin adding dynamic functionality to website
- April:
 - Completed enhancements on the validation monitor
 - Continue adding/optimizing features
 - Started enhancements for the identification guide
- May
 - Complete website frontend/backend development
 - Final meeting with client to ensure longevity of our work



Work Completed for the validation monitor

- Added functionality in the backend to score points for
 - Users who find rare species. 9 points
 - Users who find threatened species that are:
 - Vulnerable. 9 points
 - Endangered. 10 points
 - Critically endangered. 12 points.

Validation monitor Map



Validation Monitor User Questions

Please validate the following shark image.



Suggested Species:

Carcharhinus spp. 0.88
Carcharhinus perezi 0.02
Carcharhinus amblyrhynchos 0.02

Post URL

Identification guide



Is this a shark?

Yes

No

In an aquarium?

Yes

No

Common Name

Species Name

Please fill in species name

Comments

Submit

Dismiss



How was it done?






- Rare Functionality
 - Front end file sends a query to count number of user input species we have in the validated table in the database
 - Front end file sends the query to count the total number of species in the database
 - Both numbers will be divided
 - Baseline is set at 30%. Anything less than that is rare



How was it done?

- Endangered, critically endangered and vulnerable species
 - Built an in memory web browser data structure to store these lists obtained from IUCN red list of threatened species
 - User input is passed a POST request from a backend R file
 - Input is checked if it fits either category
 - Updates the user points in the database

Leader-Board New Changes

User	ValPoints	Level
jeremy  	1166	5
Dhruv Dharamshi  	761	4
Francesco Ferretti 	470	3

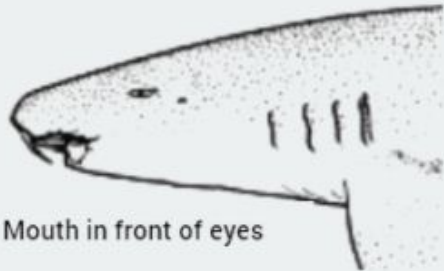
User	Coins	Level
jeremy  	1166 	5
Dhruv Dharamshi  	761 	4
Francesco Ferretti 	470 	3

Identification guide

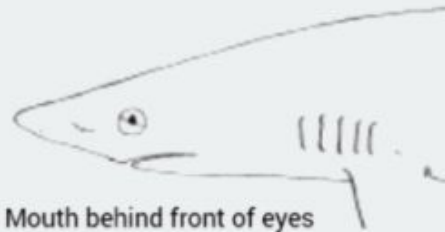
Mouth in front of eyes?

Yes

No



Mouth in front of eyes



Mouth behind front of eyes

Back



Identification guide

- Implemented in an R script for using an Rshiny app
- Filled a shark characteristics spreadsheet
- Builds an in-memory data structure to process entries
- Present new questions on the website

Spreadsheet example

species	group	anal fin	5 gill slits	6 gill slits	7 gill slits	dorsalspine1	dorsalspine2	flattened body
Alopias superciliosus	shark	1	1	0	0	0	0	0
Alopias vulpinus	shark	1	1	0	0	0	0	0
Alopias pelagicus	shark	1	1	0	0	0	0	0
Brachaelurus waddi	shark	1	1	0	0	0	0	0
Heteroscyllium colcloughi	shark	1	1	0	0	0	0	0
Carcharhinus leucas	shark	1	1	0	0	0	0	0
Triaenodon obesus	shark	1	1	0	0	0	0	0
Carcharhinus plumbeus	shark	1	1	0	0	0	0	0
Rhizoprionodon acutus	shark	1	1	0	0	0	0	0
Negaprion brevirostris	shark	1	1	0	0	0	0	0
Glyphis gangeticus	shark	1	1	0	0	0	0	0
Isogomphodon oxyrinus	shark	1	1	0	0	0	0	0
Carcharhinus amblyrhynchus	shark	1	1	0	0	0	0	0
Carcharhinus galapagensis	shark	1	1	0	0	0	0	0
Rhizoprionodon porosus	shark	1	1	0	0	0	0	0

1 = present

0 = not present

Small example of how contents were parsed

```
JS parse.js > ...
1  const { Console } = require('console');
2  const ExcelJS = require('exceljs'); // If there is an error, run: npm install exceljs
3
4  const wb = new ExcelJS.Workbook();
5
6  const fileName = 'elasmotaxonomy.xlsx';
7
8  |
9  wb.xlsx.readFile(fileName).then(() => {
10 |
11 |     var worksheet = wb.getWorksheet('elasmotaxonomy');
12 |     worksheet.eachRow({ includeEmpty: false }, function(row, rowNumber) {
13 |
```




Challenges

- New languages and frameworks
- Not all team members were available
- Website server often crashes because of too many database requests between PostgreSQL and R.



Acknowledgements

- Dr. Francesco Ferretti
- Jeremy Jenrette
- Aman Kothari
- Dr. Edward Fox



References

- <http://hdl.handle.net/10919/103254>
- IUCN. 2021. The IUCN Red List of Threatened Species. Version 2021-3.
<https://www.iucnredlist.org>.
- <https://www.iucn.org/resources/conservation-tools/iucn-red-list-threatened-species>
- <http://sharkpulse.cnre.vt.edu/>