

Improving Bokeh Documentation Search Cum Accessibility

Project Synopsis

Bokeh has immense potential to be used as a primary graphing library for data analysis. What It perhaps needs is a robust search feature. Currently, the search feature does exist, but it can definitely make do with a lot of improvements. This will not only encourage existing users to get a feel of how Bokeh continues to grow and reach new milestones, but also promote the usage of Bokeh in comparatively newer projects. The desired outcomes of my stint as an intern would not only involve coding out a no-nonsense search improvisation and implementing the same, but also auditing the documentation and bokeh sites for accessibility using various tools and techniques.

Project Plan

The Problem

Documentation is one of the primary reasons that determines how successful a certain open source library will be. The major question which developers think of while choosing a suitable tech stack to build their applications is *"Is the library well documented? Is it well maintained? Does it have some considerable usage and error support?"*. These are exactly the questions we should be asking ourselves while going about this project idea. From the software engineering perspective:

1. Requirement Analysis

There is an immanent need to have an effective documentation search for our needs. The lack of a quick documentation search hurts the future perspectives of open source applications, and is by far, an essential and non-negligible component. We do, however, have a simple doc search, which serves as a great starting point. Linking to these documentation searches should be an appealing home page, which captures the interest of the people in an instant.

2. Specifications

Depending on the requirements, specifications can be decided. The search can be refined using the data present in the docs websites, along with some inspiration from well known documentations like scikit-learn, numpy, pandas etc. The combined documentation along with the upgraded search feature would be inputs to our accessibility tools. These tools will help us understand how we could carry about improving the accessibility of our sites, and a few other important things such as SEO. The output of this task would be the required search option and an additional layer over the plots which will make it easy for the screen readers to capture .

Some general issues connected with Bokeh:

- There's an absence of documentation; and even if there is some, parts of it are scattered throughout the netlify websites. This does not enable users, developers or external contributors from using our library.

- To get to a certain plot and understand its functions and corresponding code takes additional clicks.
- A simple Google search for some bokeh plot feature may or may not return the desired information. A refined search option within the documentation guides would greatly improve UX.
- No live run option. A live run is supported by various sites like *Python Fiddle*, which enables developers to get a feel of the component without running an entire application to see it work.

The Solution

There are multiple solutions possible. However, I'll touch upon a few here, and present my final solution in the conclusion part:-

- Using CSS
Smart way to combat the overflow within the page would be to use CSS styles and set the `display:none` for `li` elements `>10` in number. This can be done using the *nth-child* CSS property. This would include adding in a button to initiate the "Show more" activity.

Pros:

1. Will fix the page fillup issue
2. Simple and easy fix.

Cons:

1. The huge JSON load will still remain to be an issue.

- Using *JSON splicing*
We could splice the JSON to render only the first few results, which will most likely be sufficient.

Pros:

1. The JSON load is reduced.
2. Takes much less time to fill in results.

Cons:

1. One spliced, the resultant JSON will be fed. The rest of the content in the JSON is lost.

- Using Docsearch (Powered by Algolia)
Algolia provides docsearch, and it is free to use for open source projects! Bootstrap, VueJS, React, you name it. It will do some scraping and indexing, and help us set up the docsearch as well. We don't have to spin up any instances, but rather just fill up a form and the rest will be done for us.
<https://docsearch.algolia.com/>

Pros:

1. Lightning fast queries
2. Provides the Best UX.

Cons:

1. No real control over the Indexing and Searching as such, unless we spin up our own instance.

- Using GCSE

The google custom search may be a feasible option given its widespread use.

Pros:

1. Easy to configure and setup.

Cons:

1. May not account for versioning
2. Is quickly getting replaced in favour of other options.

- Using *SphinxSearch*

Pros:

1. Easy to integrate

Cons:

1. There may be better alternatives, given its sparse usage.

In conclusion, I'd like to think the approach involving DocSearch (powered by Algolia) seems like the most suitable, given that I'm comfortable with working with both, and the project, in my opinion, aims to incorporate the same. Incorporating the JS file might need some work, but once it's set up, I do think it would be a really big boost for Bokeh. Algolia also offers one of the best customer support, and they have been successful in deploying algolia's features to many well known open source frameworks. I would love to work hand in hand with them to get the best results possible. As far as accessibility goes, for the most part, we would have to see how this could be improved. We do know that the sphinx features could be overwritten with custom ones, and certainly there would be a clever Javascript based, or pure HTML based approach to do the same. What follows is a list of simple accessibility reports that were generated on the docs website, which could be extended to the main bokeh website as well.

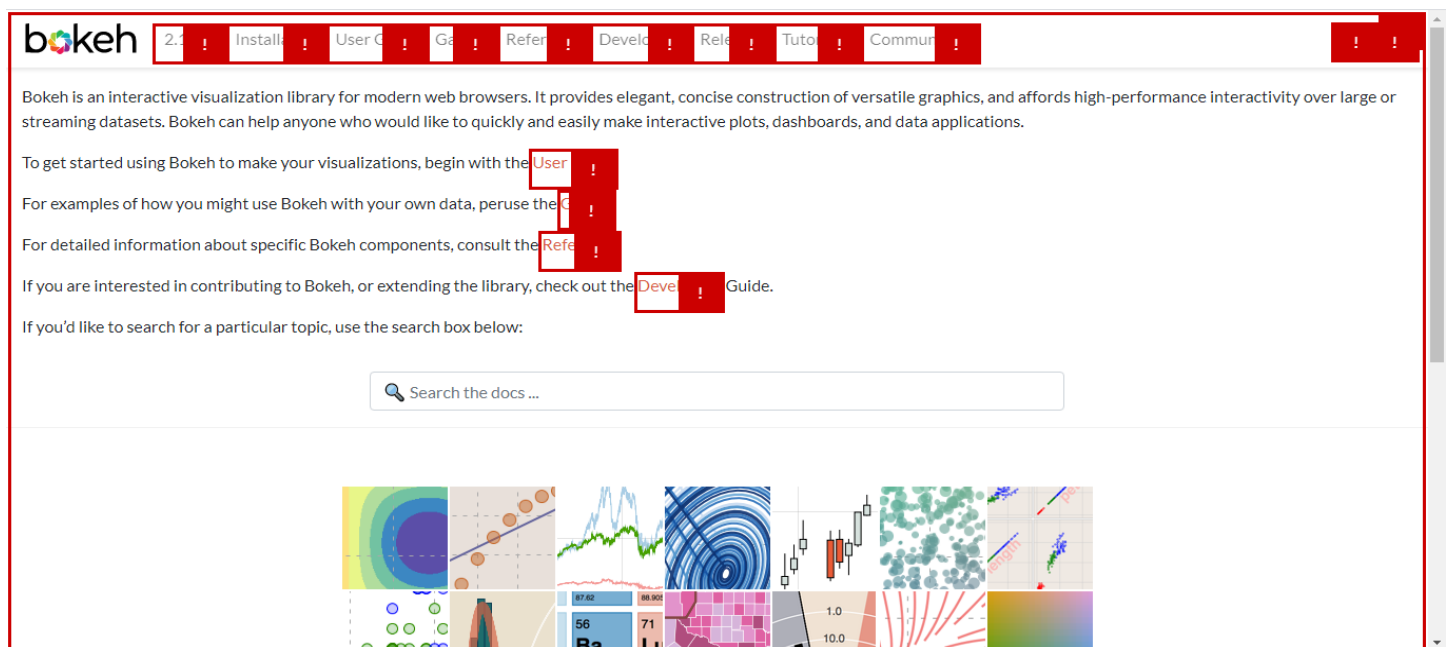
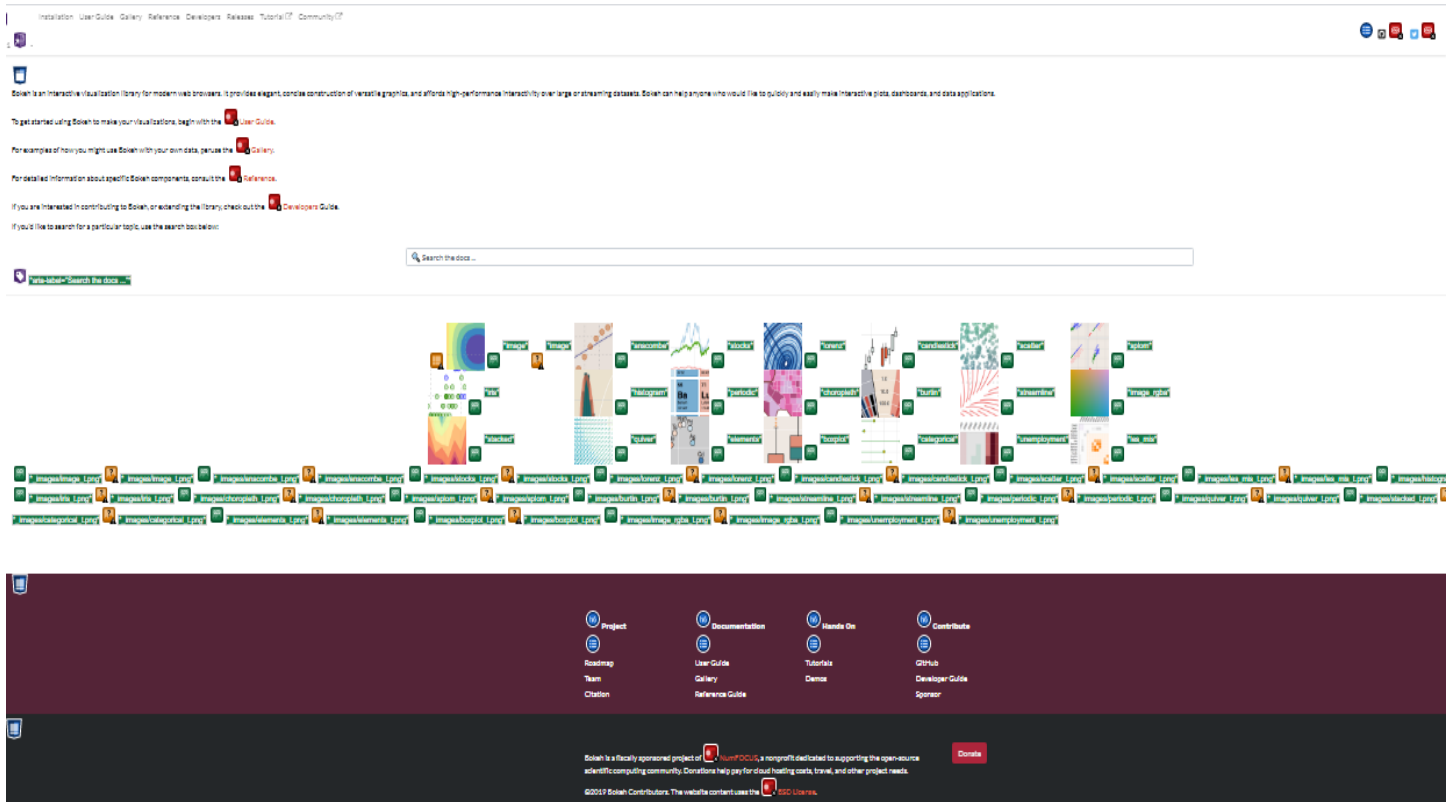
Project	Documentation	Hands On	Contribute
Roadmap	User Guide	Tutorials	GitHub
Team	Gallery	Demos	Developer Guide
Citation	Reference Guide		Sponsor
	Accessibility		

Bokeh is a fiscally sponsored project of NumFOCUS, a nonprofit dedicated to supporting the open-source scientific computing community. Donations help pay for cloud hosting costs, travel, and other project needs.

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(Sample proposed footer with an accessibility menu included, not for inspection)



(Sample reports generated from WAVE and Accessibility insights for web tool, not for inspection)

For an inspectable report, please visit here:

<https://nimishbongale.github.io/archives/bokeh-report-211.html>

Research & References

1. <https://docs.readthedocs.io/en/stable/index.html>

2. <https://github.com/readthedocs>
3. <https://www.sphinx-doc.org/en/master/>
4. <https://guides.github.com/features/wikis/>
5. <https://github.com/bokeh/bokeh/issues/10038>
6. <https://docs.bokeh.org/en/latest/>
7. <http://pythonfiddle.com/>
8. <http://sphinxsearch.com/blog/category/performance/>
9. <https://docsearch.algolia.com/>
10. <https://www.elastic.co/blog/whats-new-in-elastic-stack-7-8-0-release>
11. <http://sphinxsearch.com/downloads/current/>

Timeline & Deliverables

Timeline	Deliverables
Pre-Internship	❑ Understand bokeh as an organisation, its work and related ethics. ❑ Have a look at bokeh's github repositories and understand the code structure. ❑ Open Issues and PR's to get acquainted with the repository workflows. ❑ Interact with Mentors and establish the basic ideas regarding the project in question. ❑ Further research about the needs of the project, and ponder over its potential impact after implementation.
Week 1 (09/14 - 09/21)	❑ Understand bokeh in greater depth, and their existing components. ❑ Design a work structure keeping in mind how everything would eventually span out. ❑ Interact with mentors and other team members, establish a rapport.
Week 2 (09/22 - 09/28)	❑ Tackle queries regarding the choice of tech stack chosen and seek approval. ❑ Survey website for accessibility using WAVE and generate accessibility insights for the web using advanced setups.
Week 3 (09/29 - 10/06)	❑ Make changes that can be done without having to mess around with the code a lot to enable accessibility. ❑ Keep the code ready for accepting documentation contents. Have github configured for continuous integration and deployment.
Week 4 (10/07 - 10/14)	❑ Publish regular updates regarding accessibility through report generation from "Accessibility for Web" insight tool (generates HTML)
Week 5 (10/15 - 10/22)	❑ Get complete approval on the reports and consequent fixes. ❑ Work with Algolia and think about the integration options.
Week 6 (10/23 - 10/30)	❑ Write a mid-internship blog post describing work done and how the experience has been so far with bokeh. ❑ Integrate the preferred solution.
Week 7 (10/31 - 11/07)	❑ Prepare a cheat sheet of sorts if any new method happens to be integrated. ❑ Test the new search for queries. ❑ Design a page for mentioning how bokeh tackles accessibility.

Week 8 (11/08 - 11/15)	☐ Commit implementation code to Github, which can then be embedded in the documentation. ☐ Finish writing an abstraction accessibility layer over the current code for which a screen reader can pick up.
Week 9 (11/16 - 11/23)	☐ Finalize on the guides and write documentation for the same. ☐ Carry out the necessary integration. ☐ Publish a sample build for viewing and surveying purposes.
Week 10 (11/24 - 11/30)	☐ Survey development builds for Accessibility using WAVE and Accessibility Insights for Web can be added in our website. ☐ Include an accessibility footer menu option and develop a page linking to the same. ☐ Integrate the accessibility page to the main site.
Week 11 (11/30 - 12/05)	☐ Work towards improving the report statistics until they reach a respectable target. ☐ Write a blog post summarizing everything, and about my performance cum involvement in bokeh.
Week 12 (12/06 - 12/12)	☐ Seek daily approvals until everything is finalised. ☐ Go through my writings and code up to ten times for any miniscule errors.
Week 13 (12/13 - 12/19)	☐ Clean code, make sure everything is properly linted and ready before the final closing commits. ☐ Configure the a github-super linter to ensure code quality. ☐ Publish the "Concluding Internship" blog post, rounding up my wholesome journey. ☐ Seek final approval.
Post-Internship	☐ Promote the use of bokeh. ☐ Interact with the community, answer queries or doubts regarding bokeh. ☐ Carry out maintenance work of the repositories I've contributed to. ☐ Keep resolving relevant issues in the bokeh repositories, making contributions if necessary. ☐ Leverage experience gained during this internship for future endeavours.

Questionnaire

Why are you interested in working with Bokeh out of all the mentoring organizations available?

My interest in the Bokeh organisation hasn't been perfunctory, by any means. I actively work with scikit-learn and matplotlib, and this led me to discover a whole new section of plotting libraries. This drove me to research about bokeh, which is when I stumbled upon the bokeh organisation and its goal of making content freely accessible to the masses. When I was acquainted with the fact that bokeh was participating in GSoD 2020, I had to put my best foot forward.

Why are you interested in working on this project in particular?

I'd like to think I am quite a bit of a "stickler for perfection" when it comes to styling elements and Accessibility; if I say so myself. My disposition to working with HTML, CSS, SCSS, SASS and JS incessantly led me to choose this project over the others. I'd also like to believe I'd be a great fit for this particular project given my extensive work

in the front-end side of things, not to mention my inherent inclination towards researching, technical writing and blogging. I'm also an SEO freak, and I felt that a combination of the two would be in the best of my interests!

Why are you well-suited to take on this project?

Given my past project work, and current interests, I firmly believe this project presents me with an opportunity like none other; going beyond just a perfect amalgamation of my skills and interests. My principal skill set involves proficiency with front-end frameworks such as ReactJS and mobile app development using React-Native. In recent times I have written medium articles about UX research, and I've been itching to contribute in terms of code in this domain. As mentioned in the "*Timelines and Deliverables*" section, the chalked out plan best portrays my ability to adhere to deadlines and plan out things such that there is a logical unidirectional flow in carrying out the same. Putting my skillset to the best use has always been my primary concern, and it shall definitely bring immediate value to bokeh as an organisation.

Do you have any other commitments during the internship period? Provide dates, such as holidays, when you will not be available.

I do not aim to partake in any other primary commitments during the stipulated internship period. However, being an undergraduate student, I may have to give a few semester exams during it. The exact dates of these exams are still yet to be determined.

If your native language is not English, are you comfortable working closely with a mentor in English?

My entire education has been through the English medium, and therefore it would be preferred on my end as well.

Have you collaborated on a project remotely before?

Yes. On 2 occasions.

1. During the *IBM Call for Code 2019* Challenge, wherein my team had been tasked with a challenge to develop an application which will help reduce the impact of a natural disaster, or reduce its devastating after effects. Even though the main event was held offline, we had to collaborate on a remote basis after clearing the India round and submit a final application for the world final round. I'm happy to say we ended up as finalists in the Asia Region.
2. During the creation of *Project DocAid*, an award winning medical aid ecosystem which enables a hassle free experience starting from booking an appointment to getting the prescription. My team had a few offline meets, after which the majority of the work was carried out using the Github collaboration model.

Do you plan to keep contributing to Bokeh after the internship period is complete?

Yes! I plan to contribute to bokeh post the internship period, given my fondness for the organisation.

General Information

About Me

Nimish is an Information Science Engineering student at Ramaiah Institute of Technology currently in his pre-final year of Bachelor of Engineering program, with well-cultivated knowledge of Web Development, Android App Development, Data Structures and Algorithms. During the past few years, he learned the importance of utilizing

his skill sets for the betterment of society. Recently he finished a research paper on "Spider Monkey Optimization" and participated in a group project on streamlining the interactive medical diagnosis flows. He is well-versed in speaking and writing in English, Marathi and Kannada. His main hobbies are playing Chess, Badminton, Guitar and Reading books. Nimish hopes to intern in an organization in the near future whose ideologies tie best with his own.

Basic Information

Name & Contact Information			
Full name*	Nimish Nikhil Bongale	Email address*	nimishnb98@gmail.com
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Postal address*	A2, Sapphire, 16th A Cross, 1st main, Pai Layout, Old Madras Road, Bangalore, Karnataka, India - 560016	Emergency contact information*	9611799002
Websites & URLs			
GitHub*	https://github.com/nimishbongale	Homepage	https://nimishbongale.github.io/
Twitter	https://twitter.com/BongaleNimish	LinkedIn	https://www.linkedin.com/in/nimish-bongale/
Other code or work samples	https://nimishbongale.github.io/Nimish%20Resume.pdf		
Education			
Institution	Ramaiah Institute of Technology	Degree	Bachelors of Engineering
Major	Information Science	Graduation Year	2021
Courses Taken	Responsive Web Design Fundamentals, ReactJS complete course, DevZone Quest (GCP), Data Science Math Skills, Machine Learning		

Skills

Skill name	Proficiency (1-5)	Where/how you've used this skill
React Native	4	During my Internship at Divum Corporate Services Pvt. Ltd.

ReactJS	3	To build my personal portfolio and during Smart India Hackathon 2020.
VueJS	3	To build a simple chess move speed website as a side project Speedie-Vue-Chess.
Python 3	3	To build flask backend-API's, competitive coding
HTML, CSS, SCSS, SASS	4	For nearly all my works!
JavaScript	4	While working with frontend frameworks, and minimal NodeJS backend work.
Technical Writing	4	Writing chess, trivia and technical blogs on Quora, Medium articles.
Git, Github	4	For nearly all my major projects.
Full Stack Web Development	3	During the IBM Call for Code Challenge 2019.
Research in intelligent Decision Science Algorithms and Image Processing	3	Wrote a book chapter, and have research papers pending publication review.

Experience and Contributions

Brief Description	Relevant Links	Additional Notes
Internship at Divum Corporate Services Private Limited	https://divum.in/	Worked as an Intern with Divum. Contributed towards the building of a React Native Application with Blockchain technology for our client Bosch. (proprietary work)
Demonstrating a project at 9th IEEE International Conference on Cloud Computing in Emerging Markets	https://2020.ieeeccem.org/	Presented our "DocAid" project at the Pre-Conference event and adjudged runners with honorable mention.
Core Contributor and Volunteer at Google DevFest 2019	https://devfest-bglr-19.firebaseio.com/	Contributed to the making of the community made Google Developers Group DevFest 2019 website. It was deployed using Firebase.
Published a Book Chapter under Springer Publications	https://link.springer.com/chapter/10.1007/978-981-15-3689-2_6	"Spider Monkey Optimization Algorithm, a Quantifiable, Objective Study" – Wrote a book chapter published by Springer for their volume "Machine Learning for Intelligent Decision Science" under the series "Nature Inspired Computing for Data Science". This book is submitted to

		indexing in Web of Science, EI-Compendex, DBLP, SCOPUS, Google Scholar and Springerlink.
Worked as a Quora Partner	https://www.quora.com/profile/Nimish-Bongale https://www.quora.com/q/omniblog/How-do-airports-make-money https://www.quora.com/q/omniblog/The-Evolution-Of-Space-Food https://www.quora.com/How-do-I-write-a-C-program-to-evaluate-postfix-expressions-using-arrays-stacks/answer/Nimish-Bongale https://www.quora.com/q/aatwmvukgcrwqcwtd	Engaged in content creation and improving the general quality of answers and questions on Quora. Also functioned as an initial product testing member for Quora Marathi.
UXPlanet	https://uxplanet.org/microinteractions-an-essential-gimmick-6bc24fc3ff75	Wrote a blog post for the UXPlanet Medium Blog, which talks about "Microinteractions".
Winner at IBM Call for Code National Challenge 2019	https://github.com/lostandfoundry	Developed a GrEBoN/NEBoN stack website which integrated with IBM Cloud services. This application was built with an aim to apply technology for rescue and help during a natural disaster.
Core Contributor at Project DocAid	https://github.com/DocAid	Developed a patient mobile application which assists patients, thereby streamlining the entire workflow of a patient visiting the doctor with/without their previous medical records.
Core Team Member at Developer Student Clubs	http://ritdsc.herokuapp.com/ https://github.com/dsc-rit https://github.com/nimishbongale/DSC-RIT Recruitment_Test	Contributed to the making of the official DSC-RIT website. Developer Student Clubs (DSC) is a Google Developers program for university students to learn new-age technical skills. Developer Student Clubs, Ramaiah institute of technology was founded in 2012 and since then our mission has been to impart people with required computer science skills and be in sync with the latest technology and trends. As a part of DSC, I helped organize various hackathons, workshops, tech-events round the year. DSC-RIT has conducted around 50 workshops with 10+ hackathons till date. We were also featured in Google's applied CS with Android course.
Made a static	https://nimishbongale.github.io	Created a simple yet handy mouse move speed check

Speedie-Vue-Chess Website for Chess Nerds	ub.io/Speedie-Vue-Chess/ https://github.com/nimishbongale/Speedie-Vue-Chess	chess website using VueJS.
PR for fixing multiple things to do with bokehjs	https://github.com/bokeh/bokeh/pull/10074	List of things done: 1. Added a magnifying lens icon to placeholder 2. Centred the search bar 3. Made the search bar smaller 4. Centred the gallery grid images 5. Changes to docserver.py to make it compatible (Win10 + Py3.8) Things to do: 1. Efficient way to search and show results using a custom searchtools.js file.
Dependabot Configuration for Bokeh	https://github.com/bokeh/bokeh/pull/10264	Configured the newly introduced Github native Dependabot for docker and npm by checking in a .github/dependabot.yml file in the bokeh repository.