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Build Workflow process for CHAOSS D&I Badging Project

GSoC Project proposal for CHAOSS

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Synopsis

CHAOSS Diversity and Inclusion metrics[1] have been defined to measure open source diversity and inclusion across different community ecosystems. The CHAOSS D&I Badging[2] Program aims to recognize good D&I practices by assigning badges to open source projects and tech events after metric-based evaluations.

This project will be about building an environment for CHAOSS Badging. The idea is to build an efficient Open peer review[3] system and bind it with guidelines that align with the practices and D&I metrics of the CHAOSS[4] Project.

Currently, all work related to CHAOSS Badging lives at https://github.com/badging, and these are the repositories that my GSoC work will focus on.

Matt Snell[5], Matt Germonprez[6] and Saleh Abdel Motaal[7] are the mentors for this project.

Benefits to the Community

As stated in badging/diversity-and-inclusion[8] README, diversity in open source is not transparent, since contributors are distributed globally. CHAOSS D&I Badging project seeks to remove the ambiguity around D&I practices and highlight the best ones for making software projects and tech events more welcoming to a wider group of people.

This project will implement CHAOSS D&I metrics in an environment where they will inspire positive conversations about inclusion practices. The open review system will allow volunteers to contribute to CHAOSS D&I through their evaluations.

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[1] github.com/chaoss/wg-diversity-inclusion/tree/master/focus-areas
[2] github.com/badging
[3] en.wikipedia.org/wiki/Open_peer_review
[4] chaoss.community
[5] github.com/Nebrethar
[6] github.com/germonprez
[7] github.com/smotaal
[8] github.com/badging/diversity-and-inclusion/blob/master/README.md#problem-statement

Current Status of the Project

As of now, the CHAOSS Badging project has evaluation criteria defined for Events[9] and Projects[10]. There are separate repositories for tracking both kinds of submissions, along with a metric based questionnaire as a Pull Request[11] template in each repository. A mock submission consists of:

- Commits[12] made to a Markdown table after forking the Event[13] or Project[14] repository
- Creating a Pull Request, and along with that, filling out a PR template[15] which has questions based on D&I metrics
- The Pull Request is used as a space for providing feedback on submissions

The metric based questions (criteria) for reviews exist for both Events and Projects. There are clear Badge levels[16] in place.

Goals

Build an inclusive Open peer review system

In a traditional Open peer review[17] system, the emphasis is on keeping review reports of a scholarly work public and involve more people in the process. The review process for the CHAOSS Badging program will build on the same basic ideas. The reference for building the CHAOSS Badging review process would be the procedure followed by the Journal of Open Source Software[18] for their paper reviews.

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[9] github.com/Nebrethar/Docs-Diversity-Inclusion-Badging/blob/master/Event/Criteria.md
[10] github.com/Nebrethar/Docs-Diversity-Inclusion-Badging/blob/master/Project/Criteria.md
[11] help.github.com/en/github/collaborating-with-issues-and-pull-requests/about-pull-requests
[12] help.github.com/en/github/managing-files-in-a-repository/adding-a-file-to-a-repository-using-the-command-line
[13] github.com/badging/event-diversity-and-inclusion/blob/master/README.md#diversity-and-inclusion-badging-for-events
[14] github.com/badging/project-diversity-and-inclusion/blob/master/README.md#diversity-and-inclusion-badging-for-projects
[15] help.github.com/en/github/building-a-strong-community/about-issue-and-pull-request-templates#pull-request-templates
[16] https://github.com/badging/diversity-and-inclusion#badge-levels
[17] en.wikipedia.org/wiki/Open_peer_review
[18] joss.readthedocs.io/en/latest/submitting.html

Extend and improve existing work on CHAOSS Badging

The existing setup for the CHAOSS Badging project is on GItHub. This goal will continue the work on the same platform, by using previously created Pull Request templates and badge levels.

Create a simple procedure for reviewers to get involved

Reviewers would likely be volunteers interested in Diversity and Inclusion practices. It is important to engage reviewers in this process because their feedback will drive the applicant to improve their data and practices.

Stretch goal: Explore Open Badges as a format for Badges

Open Badges v2.0[19] exists as an IMS standard. It uses JSON-LD with images to bake metadata into an image. Open Badges can be validated and shared using Backpacks, one example being Badgr[20]. While this would be a promising shift for the D&I CHAOSS Badging program, as it would make it easier to define validity for Badges, the implementation for Open Badges for the purpose of CHAOSS Badging is a tricky one, and thus would require more investigation.

Deliverables

Deliverable 1: An operational process for Badging created with guidelines in place

EXPECTED BY EVALUATION ONE

Defining the CHAOSS Badging submission flow, setting up the review process, defining guidelines for Events and Projects and all work related to setting a functional groundwork for CHAOSS D&I badging would come under this deliverable.

Deliverable 2: Integrated bots for automating parts of Badging workflow

EXPECTED BY EVALUATION TWO

After completing Deliverable 1, the workflow for CHAOSS Badging would need to be automated so that the review process could be continued with only bots left to deal

[19] www.imsglobal.org/activity/digital-badges
[20] badgr.com/

with repetitive tasks like displaying the review checklist. The workflow can be divided into smaller parts that can be automated, and this will make the process significantly faster.

Deliverable 3: Fully refined and Documented D&I badging process

FINAL CODE SUBMISSION

This deliverable corresponds to the final code submission. This includes work from other two deliverables and documentation for the CHAOSS Badging project. The documentation would exist in two places:

- The guidelines and rules in a concise form, on the related repositories.
- A more detailed externally facing documentation for potential applicants and reviewers.

Expected Results

Part One

The CHAOSS Badging workflow will take in details about a project or an event based on predefined questions, and return a badge which can be showcased by the applicant. In other words, this workflow will convert qualitative answers about diversity and inclusion into a badge assigned on the basis of D&I metrics.

To achieve this, the workflow can be divided into several building blocks:

1.1 Submission and Reviewer guidelines

Submission guidelines will define the minimum qualifications for a CHAOSS Badging submission. These will be completely different for Events and Projects. Project submission criteria as of now has been adopted from JOSS submission requirements[21], which can be extended to fit CHAOSS Badging purpose.

Review guidelines will set the rules for how reviewers should view and evaluate submissions. These will be created so that reviewers can understand what CHAOSS Badging is about, eligibility criteria for becoming a reviewer and so on. These will be loosely based off Reviewing for JOSS[22] page.

[21] https://joss.readthedocs.io/en/latest/submitting.html#submission-requirements
[22] https://joss.readthedocs.io/en/latest/reviewer_guidelines.html#reviewing-for-joss

1.2 Roles

The evaluation of D&I metrics here would involve people. Defining roles that people could be assigned during the process would set rules and expectations for where and how interaction about the badging application would take place.

The engagement level of participants and their responsibilities during a CHAOSS Badging evaluation will depend directly on their role in the process. Here are some initial pointers on starting with defining a Role within the CHAOSS Badging process:

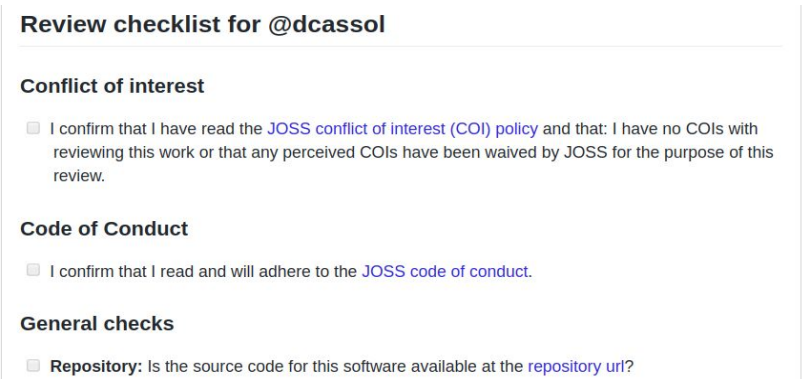
- Is the person expected to initiate a submission?
- Is the person a maintainer?
- Are they responsible for providing feedback to applicants?
- Are they responsible for providing instructions about CHAOSS Badging?

1.3 Review Checklist

This would exist in the form of a PR comment[23] on a CHAOSS Badging submission. This checklist would contain information about:

- Reviewer agreement to Code of Conduct and Conflict of Interest policy
- List items based on five D&I metrics each for Events and Projects

The reviewers will be given access to edit this checklist.
Here's an example of a JOSS review checklist[24]:



Screenshot of a Review Checklist from a JOSS review

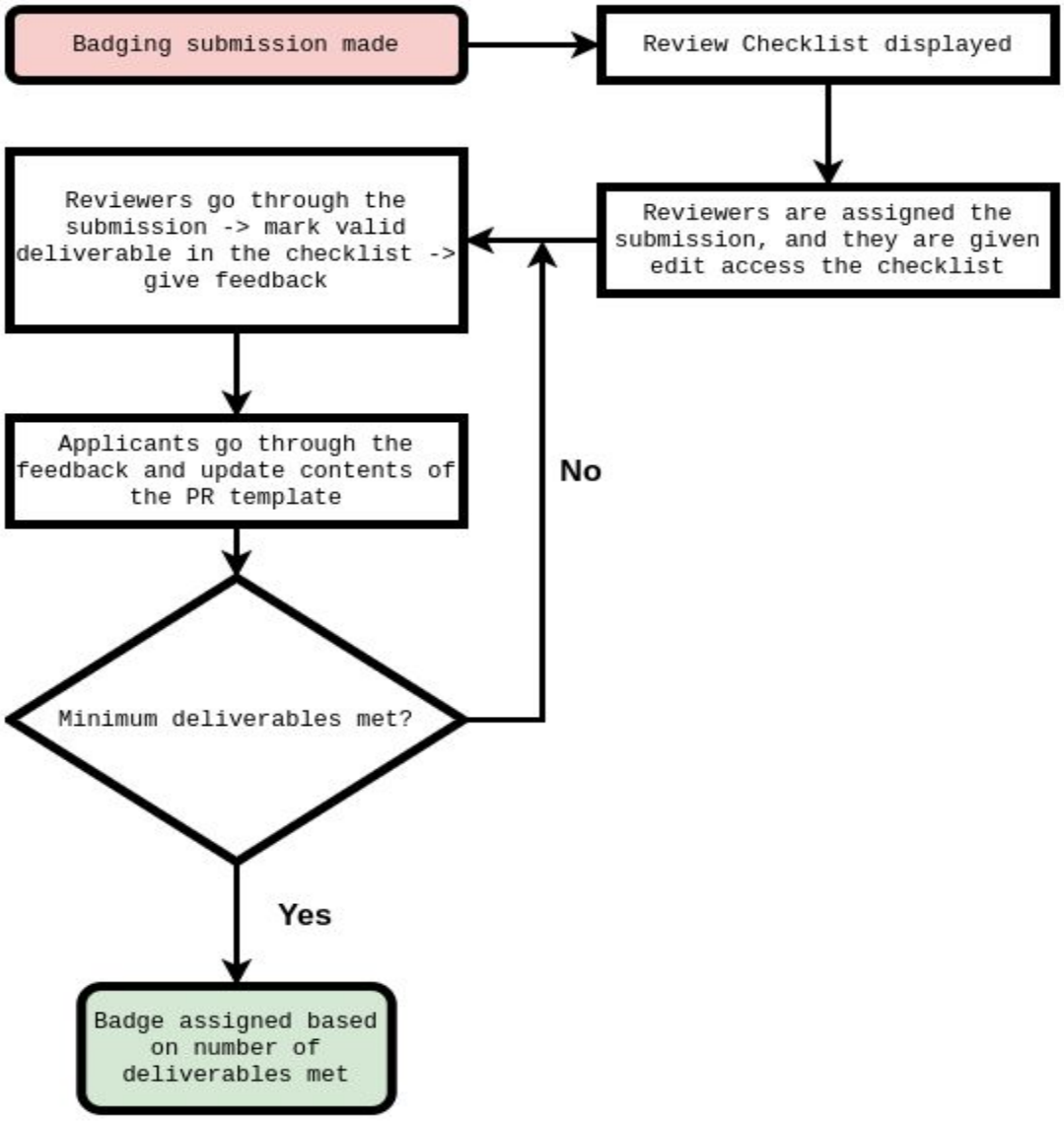
[23] https://help.github.com/en/github/collaborating-with-issues-and-pull-requests/commenting-on-a-pull-request
[24] https://joss.readthedocs.io/en/latest/review_checklist.html

Part two

After setting the groundwork, these will be the parts which will involve people and assist the review process.

2.1 Open peer review process

This is the part of the workflow which combines the components described above, involves people and ends with a definitive result.



Above is a minimal representation of the Open Peer Review process that CHAOSS Badging can use. It assumes that reviewers will give feedback to the applicants until they meet minimum requirements for earning a badge. However, in a more realistic application, a few other cases would be added to this model:

- ❖ Reviewers give feedback until no more improvements can be made
- ❖ Different feedback applications for Events and Projects: as Events are dependent on time, and they may have happened before or might happen after the application.

2.2 Workflow automation

The platform used for CHAOSS Badging is GitHub, and the submission and badge assignment would take place over a Pull Request. Using GitHub bots to handle common tasks would make the process faster on the software side.

There are two ways to automate workflows on GitHub which are relevant here:

- **POC: Using Probot + GitHub Apps**
  GitHub Apps[25] have a separate identity on GitHub, not requiring the use of a service or bot account. They are great for reacting quickly to events on GitHub, like opening a Pull Request. Probot[26] is a framework for building GitHub Apps in Node.js.

  GitHub apps are not written to be repository-specific and are only triggered by specific GitHub Webhook Events[27]. This would be helpful for CHAOSS Badging as Event and Project will have similar GitHub workflows, but different content for review.

- **MVP: Using a GitHub bot which acts like users**
  These bots are identified on GitHub as separate accounts. These are triggered when they are mentioned[28]. These bots are OAuth Apps[29] and they can be configured to recognize certain commands.

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[25] https://developer.github.com/apps/about-apps/
[26] https://probot.github.io/docs/
[27] https://developer.github.com/webhooks/#events
[28] https://help.github.com/en/github/writing-on-github/basic-writing-and-formatting-syntax#mentioning-people-and-teams
[29] https://developer.github.com/apps/building-oauth-apps/

These OAuth apps require a large area of permissions over a GitHub repository but for this purpose, a small set of specific permissions is sufficient.

Most of the CHAOSS Badging process can be divided into a set of specific tasks which can be addressed by separate GitHub Apps.

Part three

3.1 CHAOSS Badging Documentation

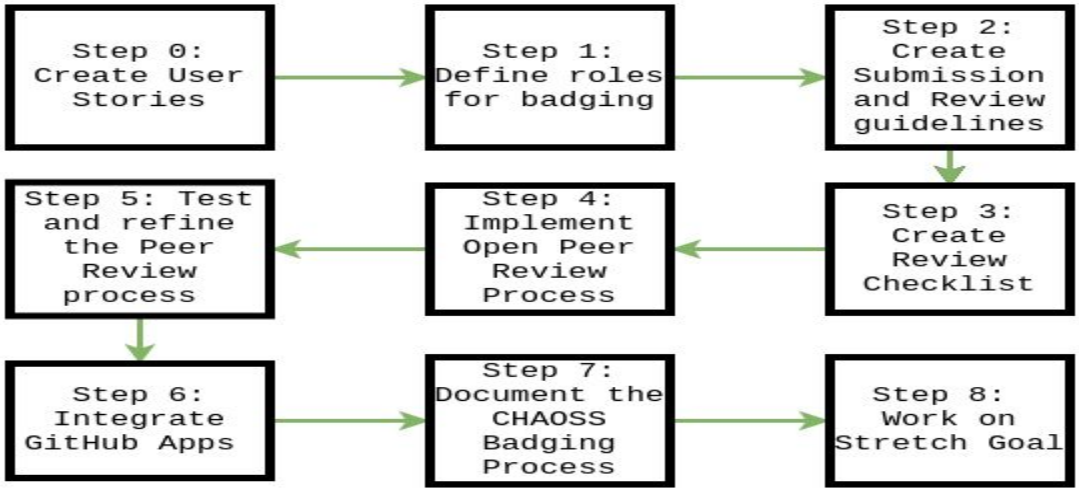
Here I've included documentation as a separate component because it is the part that would help potential applicants and reviewers to know about how CHAOSS Badging works, why does it exist, and how they can participate. This would detail all components built above, and help reviewers and applicants connect their goals with the goals of the CHAOSS Badging program.

Other outcomes

- Code of Conduct for for all participants
- Conflict of Interest policy for reviewers
- Contributing guidelines for new contributors
- A 'How to become a reviewer?' document

Approach

According to deliverables, the approach will be divided into three phases. To further divide the implementation, there will be nine steps.



Phase one: Creation

Step 0: Creating user stories

In order to test out the submission flow from a human perspective, the initial step would be to create user stories. These user stories would be a high level overview of what any CHAOSS Badging participant would expect from the process. Also, these will form a base for the next step.

For this step, I'll communicate with the CHAOSS Badging maintainers and address any prior feedback they might have.

Example:

Step 1: Defining Roles and permissions

Allocating roles to people would also mean defining the level of permissions they would have to alter submission content on a GitHub PR.

Some basic roles and the permissions they will be granted could be as follows:

- Applicant - edit access to their own comment
- Reviewer(s) - edit access to the Review Checklist
- Maintainers - Access to the repository, and merge permissions

GitHub's own reference for permissions within an organisation is here[30].

[30] https://help.github.com/en/github/setting-up-and-managing-organizations-and-teams/repository-permission-levels-for-an-organization

Step 2: Creating Submission and Reviewer guidelines

Submission guidelines would act as a filter for what Projects / Events the CHAOSS Badging process would evaluate. These will be positioned as the first thing after the CHAOSS Badging introduction that a potential applicant will come across. The shorter and more concise form of these guidelines will be created during phase one. The more detailed documentation would be created during phase three. Reviewer guidelines will follow a similar pattern.

Step 3: Create Review Checklist

Written in Markdown, the Review Checklist will be displayed by a GitHub App whenever a Pull Request is opened on the CHAOSS Badging repository.
The review checklist will be detailed, as it will contain concrete information and checkpoints about which D&I metrics a submission aligns with. Reviewer(s) will have access to edit this checklist. It can initially be broken down into following parts:

- Reviewer statements
- Metrics applicable (only valid for events)
- Conclusive statements about each applicable metric

Step 4: Implement Open Peer Review process

To truly implement an initial peer review process for CHAOSS Badging, there is one more part that will need to be set up: reviewer sign up. Journal of Open Source Software involves reviewers by accepting volunteers and asking them about the technologies that they are comfortable reviewing. CHAOSS Badging can adopt this system, and use it with their own guidelines.

Phase two: Automation

Step 5: Test and refine the peer review process

This step will be about manually testing out how the peer review process and associated permissions work out. After testing based on the user stories built in step 0, and checking if all permissions work as expected, it would be time to target and automate repetitive parts of the process. Testing would be done by creating a mock Pull Request.

Step 6: Integrate GitHub Apps

Based on the review process built by far, the most constant and repetitive parts will be targeted for automation first. GitHub Apps built using Probot will handle and respond to the events for those parts. This will improve response time significantly.

Probot based apps can be configured using YAML files, and also build from scratch using JavaScript.

Here is a list of some pre-built Probot Apps that can be combined for creating a smoother workflow:

- Developer Certificate of Origin[31] - Enforces DCO certification on a PR, meaning checks on a PR would pass only if a commit contains a DCO sign off.
- Auto Assign[32] - This App can be configured to assign reviewers to a PR when it is opened.
- Minimum Reviews[33] - Enforces minimum number of reviews required for a Pull Request.

This step would be about exploring the ecosystem of Probot Apps that can be used with CHAOSS or building GitHub Apps from scratch as required.

Phase three: Documentation

Step 7: Document the CHAOSS Badging Process

Documentation would exist in two places:

- In CHAOSS Badging repositories[34], in the form of Markdown Templates.
- Hosted on Read the Docs[35], generated using Markdown[36] and Sphinx[37].

The second kind of documentation would be more detailed and will cover all aspects of CHAOSS Badging built in the previous two phases.

Through this step, I will be documenting all guidelines and code sequentially.

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[31] https://probot.github.io/apps/dco/
[32] https://probot.github.io/apps/auto-assign/
[33] https://probot.github.io/apps/minimum-reviews/
[34] https://github.com/badging/
[35] https://docs.readthedocs.io/en/stable/
[36] https://en.wikipedia.org/wiki/Markdown
[37] https://docs.readthedocs.io/en/stable/intro/getting-started-with-sphinx.html

Step 8: Explore Open Badges implementation

This step will be reached when all essential work has been completed. Open Badges have more applications for purposes of learning. I'll explore available documentation[38] on open badges and discuss with my mentors how this standard might be used for CHAOSS Badging.

Technologies

- **Languages:** JavaScript (for writing GitHub Apps)
- **Markup:** Markdown (for writing guidelines and documentation)
- **Framework:** Probot
- **Configuration:** YAML[39]
- **Platform:** GitHub

Timeline

Period	Task
After proposal submission [April 1 - May 4]	• Continue contributions to CHAOSS Badging - focusing on backlog[40] section of the project board • Gain more familiarity with GitHub API v3 and Probot
Community bonding period [May 5 - May 31]	• Discuss proposal with mentors and make any changes as required • Create User stories • Adopt Code of Conduct from chaoss/governance[41] and modify it for Badging
Week 1 and 2	• Write about Roles based on user stories

[38] https://www.imsglobal.org/sites/default/files/Badges/OBv2p0Final/index.html
[39] https://yaml.org/
[40] https://github.com/badging/meta/projects/1#column-8123683
[41] https://github.com/chaoss/governance/blob/master/code-of-conduct.md

[June 1 - June 14]	• Define what GitHub permissions each participant would have • Define Submission and Reviewer Guidelines • Gather feedback from mentors and rework accordingly
Week 3 and 4 [June 15 - June 28]	• Create Review Checklist and a GitHub App to display it • Ask mentors for feedback and make changes accordingly • Write detailed documentation for Submission and Review Guidelines
Phase one Evaluation [June 29 to July 3]	
Week 5 and 6 [July 4 - July 19]	• Create a GitHub App to display Review Checklist on when a submission PR is opened • Test the peer review process through mock pull requests • Explore the scope of GitHub Apps that can be built
Week 7 and 8 [July 20 - July 31]	• Integrate GitHub Apps to make review process faster • Gather feedback from mentors and Improve the process
Phase two Evaluations [July 27 - July 31]	
Week 9 and 10 [August 1 - August 14]	• Start Documenting the CHAOSS Badging process • Sort out any bugs/leftover feedback (Buffer period)
Week 11 [August 15 - August 23]	• Wrap up Documentation • Explore Open Badges implementation
Final week [August 24 - August 31]	• Submit final work product and work report

About Me

I am Aastha Bist, a second year Computer Science undergraduate student. I have contributed to various open source projects for over one year and I've been involved with the CHAOSS project since February 2020. I have experience writing C, Java, Python and JavaScript.

Contributions to CHAOSS

- [Issue] Resource page: Communication Channels https://github.com/chaoss/wg-diversity-inclusion/issues/72
- [Issue] Augur information and image https://github.com/chaoss/website/issues/144
- [Pull Request] Add information about Augur https://github.com/chaoss/website/pull/306
- [Issue] Discussion: Reviewer sign-up https://github.com/badging/meta/issues/17
- [Issue] Documentation: Submission Guidelines for Applicants https://github.com/badging/meta/issues/16

I have also contributed to Documentation Accessibility[42] metric during CHAOSS D&I working group meetings.

Work related to CHAOSS D&I Badging

- Microtask repository link: https://github.com/bistaastha/CHAOSS-microtasks/
- Notes on ideas about CHAOSS Badging: https://docs.google.com/document/d/1zMh-DwCSpc3FjS7YXkdJ2PsTN0YLXvaTo-uXpBNNwTA/edit?usp=sharing

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42 https://docs.google.com/document/d/1OaKDksmuoi6nhaduZ4F96mTwQJvIFnfI8BqLx4MRO38/edit#heading=h.oh6hskwlk5i7

- ❖ Mock Pull Request: https://github.com/badging/event-diversity-and-inclusion/pull/1
- ❖ A repository with some Probot Apps installed: https://github.com/bistaastha/bot-showcase
- ❖ An experimental mind-map for CHAOSS Badging: https://app.gitmind.com/doc/f9c117894

Other Open Source contributions

- [InterMine] Added color assignment table in a React-js based protein visualizer: https://github.com/intermine/bluegenes-protein-visualizer/pull/17
- [Commons android app] Created a method to underline strings: https://github.com/commons-app/apps-android-commons/pull/3310
- [a11yproject.com] Added resources in articles about VoiceOver and NVDA: https://github.com/a11yproject/a11yproject.com/pull/885

  ...and many more.

Why CHAOSS?

It was initially my interest in this project that brought me to interact with the CHAOSS community, and specifically the D&I working group. However, I stayed to contribute because of the amazing community. Matt S and Saleh helped me out a lot in understanding how CHAOSS Badging works during the weekly Badge-athons, and they even changed the timings so that I could attend. I am truly grateful to have such amazing mentors.

Work management and Communication

Here's how I plan to set up my fork of the repositories and work during GSoC:

- ❖ Making a separate branch named `latest` where I'll push my changes daily
- ❖ Merging changes from `latest` into `master` once they are finalised
- ❖ Creating pull requests from master to the upstream repository

I plan to communicate with mentors through the D&I mailing list and the scheduled Zoom calls.

Availability

I will be available full time, 40 hours a week, throughout most of the coding period. Some commitments I have are as follows:

- University exams [May 18 to June 13]
  During this period, I will be able to give about 2 - 6 hours per day to the project, depending on the frequency of exams.
- Smart India Hackathon [July 16 to July 21]
  This is including any time required for travelling. During this period I won't be able to dedicate any time to the project.

To stay on track I'll give more time to the project on weekends and use the buffer period in the third phase to complete tasks if anything is left.

I will inform the mentors of any other time commitments beforehand and keep them in the loop about the time I will be able to dedicate.

More information

For any clarifications or help, send an email to abist119@gmail.com.