Central Connecticut State University
Department of Computer Science

Software Engineering Studio
Project Proposal

Project Title:	Project Symmetry
Organization:	Grey-Box.ca
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Background Information

Grey-Box is a social innovation startup dedicated to addressing global challenges through technology. Its core philosophy centers on providing access to tools and content that promote better living conditions. We curate content that helps communities access better resources and ensure everyone has equal access to these resources, regardless of gender, culture, or location. It believes in the power of digital education to foster a healthy mind and body, adhering to the principle of "mens sana in corpore sano."

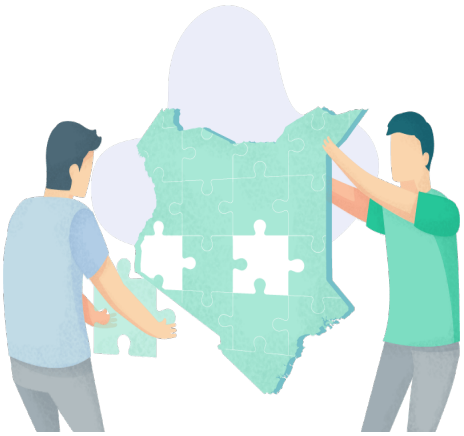
Grey-Box is committed to advancing the best methodologies and practices in social innovation. Its approach involves modernizing traditional non-profits by promoting transparency, real-time impact assessment, and fostering a dynamic, startup-like environment. Its vision is that ***everyone should have access to the same tools and resources to empower themselves and their communities.*** The mission ***is to build accessible digital tools that promote autonomy and empowerment within remote communities where the internet and electricity are often unreliable***.

By collaborating with educational institutions as internship or practicum partners, we seek to provide students with real-world problem-solving opportunities. Participants will engage with cutting-edge technologies, develop technical skills, and gain hands-on experience in a multicultural, remote-first work environment. Join us in our mission to make a significant social impact and contribute to a brighter, more equitable future for all.

[More about the company here: https://www.grey-box.ca/]

Project Description

Project Symmetry is an application using AI to accelerate Wikipedia's translation efforts in less-represented languages (less than 1 million articles) by building a semantic understanding of similar articles in various Wikipedia languages and providing relevant translations for missing information. The goal is to provide the same information no matter what native language you wish to read it in, with the idiomatic additions for each language.



Learn more here: https://www.grey-box.ca/project-symmetry/

Project Scope:

Project Deliverables

Students will be responsible for delivering the following artifacts by the end of the semester (each team can choose their scope from this list):

- Implement the UI from the in-place Figma design.
- Implement React to interface the Symmetry middleware API.
- Bundle the React UI and the Python backend into a stand-alone executable (target platforms include Windows and Mac).
- Improve middleware wiring between the UI and the comparison processing
- Implement comparison modules that leverage AI, similarity metrics, and other tools to analyze the provided source and translated content.
- Integrate the ML API interface with the comparison tools.

IT Needs and Required Skills

Our tech stack includes:

- Python for interfacing with AI models
- Electron for creating stand-alone application
- FastAPI for the defining REST API layer and assisting the Swagger documentations
- Figma for UX/UI design
- Typescript/JSX for front end implementation
- React/Svelte

Project Components

The product Symmetry is currently divided into the following software components that interact with each other but can be largely designed, implemented, and tested independently and therefore divided among different teams. These components are:

- UI
    - There is a Figma UX that's basically current (there is one change for the "diff" rendering that's not reflected)
    - Implementation is in progress of this layout

- Middleware/API
    - There are a few methods specified and implemented for the UI to call the support processing.
    - There is more to do, including designing the schema used to identify what the AI processing found, such as: Missing information on one of the languages, idiomatic analysis for a specific language, etc.
    - Methods Identifying what AI engine is used for the comparison need to be defined with a reference information in a plug-in manner
- AI comparison/analysis
    - This leverages the selected AI comparison processing
- Analytics
    - This defines and implements the raw data such as the article fetched and the comparisons requested for the purpose of later analysis and reports.

Project Challenges

Knowledge Management requires dynamic tools that can help identify similarities and differences between two pieces of information. While this can be done manually at small scale, larger documents (such as comparing 20+ pages long Wikipedia articles) can require significantly larger context windows - making it difficult to process without assistive technology.

Since the purpose is to help the user visualize how information is related by using an intuitive UI/UX. The interface should also account for a variety of input formats (Wikipedia's article, text documents, Websites) that it can compare, regardless of their language (by translating to a common language, if needed).

What can the interns/ volunteers expect:

Since this is an existing project, the goal is to improve and build on top of the existing codebase.

By participating in this project, students will:

- **Engage in Real-world Problem Solving:** Address the significant global challenge of language barriers in knowledge management.
- **Develop Technical Skills***:* Work with cutting-edge technologies including React, JavaScript, Python, and FastAPI
- **Gain Hands-on Experience:** Learn about AI integration, and UI/UX design.
- **Collaborate in a Diverse Environment:** Experience a multicultural team dynamic and remote-first work principles.
- **Impact Global Health:** Contribute to a project with real-world applications and the potential to improve information management worldwide.

Fully Remote Internship Opportunity

Grey-box offers a fully remote internship model, leveraging technology to connect students and learners worldwide. This allows participants to gain practical experience while collaborating with a global team, all from the comfort of their location. This flexible and innovative approach ensures that our interns can contribute effectively and grow professionally, regardless of geographical barriers.

Support and Guidance Provided to the Students (What do we offer):

- **Regular Touch Bases:** Regular meetings with the CEO and IT/marketing teams to provide direction, support, and feedback.
- **Coaching and Training:** Access to resources and training tailored to project needs and individual growth.
- **Diverse Work Environment***:* Learn and work in an inclusive, supportive environment where diversity is a strength. Grey-box is a nonprofit structured under the principle of mobile-first and remote-first. Diversity is not only encouraged, it is an integral part of the strength of the team and its projects.

Sponsor-Provided Hardware and Software
Grey-box will provide access to software and collaborations tools

Sponsor and Project Specific Deliverables
- Possible options and literature review
- Recommendations (The MoSCoW Method or similar)
- Documenting (on Github and Notion)
- Video demonstration of the prototype
- Final report and recommendations

Proprietary Information

This is an open-source project. An NDA will be provided for matters related to other information that you might access on our platforms.