

Project Title: Spanish NLP

SEÑAL is a modular natural language processing (NLP) application intended to analyze and evaluate different components of essays written by students of Spanish as a second language (L2). SEÑAL is intended to provide a lexical-syntactic analysis of the complexity of an L2 essay, information about the frequency of various grammatical forms (such as nouns, adjectives, adverbs, and various verb tenses), a grammatical agreement checker, a ML L2 proficiency classifier, and a machine translation identification system.

At present the SEÑAL application has been deployed but there are functionality issues related to the Web app conversion that was done previously; these need to be resolved, as well as implementing new features in order for the application to be ready for general use by students, faculty and the general public. You do not need to know Spanish or be deeply familiar with natural language processing to participate in this project.

The client for this project will be Dr. Falcon Restrepo-Ramos, a faculty member in the MSU Philosophy, World Languages and Cultures department. Additionally, Dr. Flint Million will provide support as the technical manager for the application and its public hosting.

Tasks for the project team will include the following:

- Repair issues with the current user login system.
- Implement PDF generation of results based on data generated by the existing code and mockups provided by client. (PDF files will be stored on the server side and will be downloadable by users)
- Finish implementing the “Credit” system used to provide users with limited use of the system and enable paid subscription functionality.
- Connect the system with a payment processing API (e.g. PayPal) for accepting payment for subscriptions.

This project will involve the following:

- Full stack Web application development using React (frontend) and Python (backend)
- Server-side generation of PDF documents and maintenance of stored files using a storage framework such as S3
- Working with existing code to enhance, optimize and fix
- Working with external APIs and cloud hosting services
- DevOps techniques including automated testing, integration and deployment of code

| Deliverables | Type of work | Activities | Resources | Tech Skills | Priority |
|--|---|---|--|---|----------|
| Requirements Analysis Document | Project planning, user experience analysis, Analyze specific scope that would be possible | Create a project plan, Define, analyze, validate, and align expectations while considering all possible conflicts. | Current code, faculty mentor, client, online resources | Reading, analyzing, technical writing | High |
| Software specification, design, development, and test plan | Software development planning | Specify requirements of software component(s) of system given new requirements and features, agree on software development and testing methodology/approach, document agreement | RAD, references materials for functionality, references from products for other sports | Software specification, agile or waterfall or hybrid methodology skills, software test planning | High |
| UI Mockups | UI/UX Design | Design and build appropriate wireframe version of additional user interface elements not already available in the application | Wireframe tools or available documentation on required development tools | graphic design principles, user-centered design Adobe Creative Cloud | Medium |
| Full Stack MVP | Software development and documentation | Develop additional functionality for frontend and backend in React and Python. | Development tools selected by team with support of client/SME | Software development in Python and React (TypeScript), software documentation | High |
| Testing Suite | Test planning, test reporting and execution | Create unit and integration testing for each layer of the project. Implement tests into CI/CD pipelines. | Testing tools for languages and tools being used | Test planning, test execution, test documentation | Medium |