Multilingual Blueprint Renderer

Field Session Project Proposal – Summer 2026

Company Background

Infinity Technology Systems is a software and managed IT company on a mission to bring modern technology to one of the most underserved industries in the world - construction and trades. While other sectors have been transformed by software, this industry still runs on spreadsheets, paper forms, and phone calls. That's the gap we're closing.

We build purpose-built software suites, AI-powered workflows, and full infrastructure solutions designed around how these businesses actually operate. The problems are real, the technology is cutting-edge, and the opportunity to make a meaningful impact is enormous.

We're growing fast and building in real time. The projects we bring to Field Session are genuine contributions to that roadmap, not classroom exercises. Students who work with us are building things that get used.

Project Background

Construction plans are dense, technical documents, multi-page PDFs packed with annotations, callouts, dimensions, and specification notes. When those plans go out to Spanish-speaking crews and subcontractors, critical details get lost in translation. ITS is looking to build a tool to fix that.

The Multilingual Blueprint Renderer takes a PDF plan set, detects all the text on each page, translates it, and writes the translated text back onto the original pages in the exact same positions. The output is a translated PDF that still looks like the original plan. No reformatting, no copy-paste into a separate document. Just the same plan, in a different language.

The core pipeline handles OCR and text region detection across the full range of what appears on a construction plan — angled callouts, small annotation labels, dimension strings, and specification notes. Extracted text is fed through a translation API or LLM with enough construction-domain context to handle technical terminology accurately. The translated text is then composited back onto the page, with the team making deliberate decisions about font sizing and handling cases where translated text is longer than the original.

The frontend is a React application with a file upload interface, language selection, page preview, and PDF export. As a stretch goal, the team can explore translating full written

specification documents, dense, text-heavy PDFs, and look into preserving formatting and table structure during translation. Infinity Commercial and Industrial is advising on the project, ensuring the tool is built around the real plan formats and language needs of a large construction operation.

This is a tool that solves a real, daily problem on active job sites. For students interested in applied AI, document processing, or building software with immediate human impact, this project delivers all three.

Recommended Stack

For the pipeline we've been envisioning, Python feels like the right backbone, with FastAPI as a lightweight API layer, PyMuPDF or pdfplumber for PDF handling, and OpenCV or a vision model for detecting text regions on image-based plans. For translation, we've looked at the OpenAI API, DeepL, and Google Translate, though we're genuinely unsure which handles construction terminology best and think that's worth the team evaluating firsthand. The frontend could be built in React with file upload, language selection, page preview, and PDF export.

We're sharing this as a starting point, not a prescription. Construction plans come in a lot of formats, and the edge cases get complicated fast. If the team finds a better approach to any part of this pipeline, we want to know about it. The right answer is whatever actually produces a clean, accurate translated plan.

Desired Skillset

- Interest in applied AI and natural language processing
- Python backend development experience, or a strong willingness to learn
- Familiarity with PDF and image processing
- Front-end development experience, React preferred
- Experience with API integrations
- Adaptable and self-directed — this project requires independent research and the ability to pick up new tools on the fly

Preferred Team Size

We recommend a team of 3 to 5 students to ensure meaningful collaboration and a well-rounded skill set across the project.

Location

All work and collaboration for this project can be done remotely. The ITS team will provide consistent support and regular feedback throughout the engagement via virtual meetings and online communication tools. Infinity Commercial and Industrial will also be available in their advisory capacity for industry context and guidance as needed.