

## Al Francis P. Pecina

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### EXPERIENCE

#### Melham Construction Corporation

##### Intern

- Estimated and prepared bill of quantities for concrete and rebar works
- Prepared structural drawings of beams, columns, and footings using AutoCAD.
- Verified structural design outputs from STAAD.Pro by developing Excel-based calculations for beams, slabs, and columns, ensuring alignment with code-based design requirements.

### PROJECTS

#### Framerino — Web-Based 3D Frame Analysis Software

[Demo Video](#), [Live Site](#)

- Developed full-stack 3D frame analysis software using direct stiffness method.
- Built Python-based solver with NumPy and SymPy for structural analysis computations.
- Designed backend with FastAPI and frontend with React + Three.js.
- Implemented load handling, DOF constraints, and result visualization for forces and deflections.

#### Project XY — Web-Based 2D Plane Strain Analysis Software

[Demo Video](#), [Live Site](#)

- Developed a full-stack web app for 2D plane strain finite element analysis of geotechnical systems.
- Implemented matrix-based FEM solver using NumPy for stress and displacement calculations.
- Built backend with FastAPI and frontend with React + Three.js.
- Enabled modeling of force-driven plane strain problems with current limitations excluding bending behavior.
- Containerized application using Docker to support mesh generation via Gmsh and resolve deployment issues with native dependencies

#### Structerino — Prototype of General Web-Based Structural Analysis Software

[Demo Video](#), [Live Site](#)

- Developed a full-stack web app for general structural analysis of various structure types.
- Built Python-based solvers with NumPy for structural computations.
- Built backend with Django and frontend with React + Three.js.
- Implemented optimization of solver routines based on structural type to reduce compute time and memory usage.

#### Zema — Personal Skin Health Diary Web App

[Live Site](#)

- Created a client-side app for monitoring skin health using React and Tailwind CSS.
- Developed full CRUD features for tracking possible irritants, medication intake, doctor appointments, and photo-journaling.
- Implemented IndexedDB based routines to manage structured client-side data.

### CERTIFICATIONS

#### Civil Engineer License

*Issued by Professional Regulation Commission (PRC)*

### EDUCATION

#### University of Santo Tomas

*Bachelor of Science in Civil Engineering*

**Honors:** *cum laude*

### RELEVANT SKILLS

**Programming Languages:** Python, TypeScript, JavaScript, HTML, CSS

**Frameworks & Libraries:** React, FastAPI, Django, Tailwind CSS, Astro

**Tools & Platforms:** Git (version control), Docker (containerization), Vercel (backend deployment), Microsoft Excel, Microsoft Word, Microsoft PowerPoint