



Smartphone Geotagging App



Problem

- GE Power & Water maintains tens of thousands of wind turbines world wide.
- Wind turbine configuration data is used to improve system designs and provide better services to customers.
- GE wants to maintain the data more accurately allowing for an easy use in the event of maintenance or upgrade by field technicians.

Purpose

- Our goal is to create a phone application that will allow field technicians to accurately record wind turbine configuration information; by taking a photo that captures this information which is then processed and stored in a database.
- The application is being created to increase productivity and reduce costs.

Software

- OCR Tesseract (C++ Based)
- Image Processing OpenCV (C++ Based)
- Front End App Phone Gap (HTML & Java Script Based)
- Back End App Django (Python Based)
- Database SQLite 3 (SQL Based)



Semester Objectives

- 1. Collect user stories and create use cases
- 2. Develop a field testable system for capturing:
 - a. Make, Model, & Serial Number
 - b. Time Stamp
 - c. Latitude, Longitude, & Elevation

Technical Approach

Phone App Server OCR Database Login Attempt Login Response **Data Submission** Parsing & Verification Text Extraction Lookup Company and Component ID's Return desired ID Upload Appended Data to Database Return Extracted Data for Verification Signal Successful Upload Update Database (if necessary) Send Changes

Accomplishments

- Image Enhancement can increase OCR accuracy
- OCR reliably information from image
- Smartphone App transfers photo and geolocation data, allow for manual correction, and auto-caches photo data in local database
- Server seamlessly integrates subsystems, handles client requests, executes OCR, and interfaces with database
- Stores work orders and turbine configuration data in database satisfying 3rd normal form
- Performed Cost Benefit Analysis of project

Future Recommendations

- Image Processing & OCR: Separate fields on plates, Logo recognition support, check results against values in database, Indicate confidence of accurate data to user
- Phone App: Use GPS at all times to capture data, Camera overlay to focus data on nameplate, Barometer plugin for accurate elevation data, User authentication tokens to allow continuous login
- Database: Use ODBC to connect multiple databases to show integration.
- Future Benefits: Scanning of ID tags, Identification for smaller components

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