# CS486C – Senior Capstone Design in Computer Science

## Project Description

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| **Project Title:** Virtual Flagstaff: Gamified Relocation Experience | |
| **Sponsor Information:**  | Padraic "Paddy" McGarry, Owner, CEO<br>Marketing/Technology<br>The Scouting Party LLC<br>Paddy@ScoutingParty.com<br>https://www.scoutingparty.com |

### Project Overview

Relocating is both logistics and lifestyle. Traditional websites struggle to convey what it feels like to live in Flagstaff—altitude, seasons, trails, neighborhoods, and community. A lightweight gamified experience can transform passive browsing into active exploration that improves learning, retention, and conversion.

The Scouting Party (TSP) is a relocation experience company in Flagstaff. We help prospective residents make confident decisions through curated virtual + in-person discovery—hiking, running, skiing, learning at the Museum of Northern Arizona, and touring neighborhoods with community partners.

Currently, we face challenges in providing this experience when the prospective residents are remote. Static web pages don't scale well for 1:1 tours or effectively convey core local context. Engagement from partners such as museums, outfitters, lenders, and employers is not unified or measurable. Additionally, there's no engaging way to teach prospective residents about key lifestyle factors like neighborhoods, altitude, climate, fire risk/insurance, commute, or schools. Finally, analytics and surveys aren't tied to CRM for targeted follow-up.

**Solution overview**

Build Virtual Flagstaff, a mobile-first web experience embedded in scoutingparty.com, where users explore a stylized map of Flagstaff and complete short adventures. NPC (Non-Player Character) hosts deliver bite-sized learning via dialog and micro-quizzes. Progress, interests, and survey responses sync to a CRM for personalized outreach.

Minimum Viable Product
- Entry portal from scoutingparty.com into a 2D/2.5D map (isometric/tiled) with four starter adventures: (1) Trails & Altitude, (2) Ski Mountain, (3) Downtown & Coffee, (4) Museum & Learning.
- Dialog/quest system with micro-quizzes and badges; accessible keyboard navigation.
- CRM integration: create/update contacts in CRM; tag interests based on adventures completed.
- Analytics: time-in-world, missions completed, quiz scores, exit points; CSV export + simple dashboard.
- Content via JSON/YAML so staff can add/edit adventures and NPC dialog without redeploying.
- Performance budget suitable for mid-range phones; WCAG 2.1 AA considerations.

A Useful System
- Expanded city layers (neighborhoods, employers, parks) with event countdowns and RSVP tie-ins.
- Partner "stops" with opt-in lead sharing and seasonal adventures (winter/summer).
- Player profiles with saved progress, achievement cabinet, and optional simple leaderboard.
- In-experience surveys, generate a tailored Relocation Report summary for download.
- Admin panel for content previews, partner scheduling windows, and question moderation.

Stretch Goals (time permitting)

- Optional multi-user presence and live guided tours for events.
- Knowledge-base powered NPC answers for richer Q&A.
- PWA offline caching for select assets; optional Three.js/Unity WebGL mini-game for the ski area.

Impact of a successful product. Prospective residents learn faster, develop realistic preferences, and engage with partners. TSP gains qualified leads, better CRM signals, and a portable platform we can replicate for other cities. Prospects gain knowledge of the community, activities, and experiences that will make relocating more healthy and enjoyable.

**Knowledge, skills, and expertise required for this project:**
- Front-end: JavaScript/TypeScript; React/Next.js; Phaser.js (2D) or Three.js (2.5D/3D).
- Back-end: Node.js/Express (or Python/FastAPI); REST/GraphQL; PostgreSQL/Firestore; auth (magic link/OAuth).
- Game systems: state machines for quests, save/load progress, simple collisions/hit-areas.
- APIs: Follow Up Boss (CRM), GA4 or self-hosted analytics, Mapbox/Leaflet.
- DevOps/QA: GitHub, CI, unit/integration testing, containerized dev, accessibility & performance testing.

**Equipment Requirements:**
- Standard developer laptops and freely available tools.
- One mid-range Windows/macOS laptop and an Android/iOS phone for testing.
- Sponsor-provided API keys (Mapbox) and sandbox/test credentials for CRM/analytics.

**Software and other Deliverables:**
- Deployed beta at a sponsor subdomain (e.g., virtual.scoutingparty.com) with test credentials.
- Product backlog and roadmap; architecture/design docs; data model; API specifications.
- Content schemas (JSON/YAML) and editor guide; example adventures and NPC dialog.
- Analytics dashboard & CSV exports; CRM tagging schema and mapping.
- User Guide and Admin/Operator Guide; short screencast demo.
- Complete, professionally documented codebase in a Git repo and handoff archive.

**Sponsor Availability:**
Primary contact is available weekly for stand-ups, reviews, and content questions. We can schedule on-site or virtual demos aligned with NAU’s capstone checkpoints.