SkillSense: AI-Powered Career Intelligence Platform
Hack Nation 2025 - Technical Report

Team Name: SkillSense SOLO Team
Project Name: SkillSense
Submission Date: November 9, 2025
Technologies: Google Vertex AI (Gemini 2.0), Angular 17, NestJS, Firebase, Weaviate

1. Executive Summary

SkillSense is an intelligent career development platform that leverages Google Vertex AI to automatically extract, analyze, and visualize professional skills from multiple sources (GitHub, LinkedIn, CVs). The platform provides AI-powered career intelligence including skill gap analysis, personalized learning paths, dynamic CV generation, and market trend insights.

2. Problem Statement & Objectives

Professionals struggle to maintain accurate skill inventories across fragmented sources, identify skill gaps, generate compelling CVs, and understand market demand. Objectives: automate skill extraction, provide AI insights, dynamic CV generation, and semantic skill search.

3. Technical Architecture

Angular 17 frontend communicates with NestJS backend via HTTP; backend connects to Vertex AI via gRPC; Firestore stores structured data; Weaviate manages vector embeddings. Tech stack: Angular, NestJS, Vertex AI, Firebase, Weaviate.

4. Implementation Approach

Pipeline: OAuth integration → data collection → Vertex AI processing → structured JSON output → Firestore + Weaviate storage. Features include skill gap analysis, AI-based CV generation, and semantic vector search using cosine similarity and weighted scoring.

5. Results & Impact

50+ skills extracted per GitHub user, <5s analysis speed, 85%+ accuracy. Automated discovery reduces manual effort by 90%, enables real-time dynamic CVs, and enhances skill discoverability by 3x.

6. Technical Challenges & Solutions

- Firestore index errors → fallback sorting
- Undefined fields → conditional inclusion
- AI parsing → JSON extraction cleanup
- Vector sync → auto-update
- Rate limiting → exponential backoff

7. Future Enhancements

Add real-time collaboration, job matching, skill verification, mobile app, and predictive analytics.

8. Repository & Resources

GitHub: youssefadel94/skill-sense

9. Conclusion

SkillSense integrates Gemini 2.0 and vector AI for intelligent skill extraction and analysis, delivering a unified, scalable platform for career intelligence.

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