# AI-Powered Agentic Interview System

## DSA Mock Interviewer

## InterviewAce

# Introduction

## The Problem

- FAANG acceptance - Google (0.2%), Amazon (1%), Meta (0.1%)
- Students need 200+ hours prep with no realistic practice
- Existing platforms - Static questions, no adaptation, no voice interaction

## Our Solution - Agentic AI Behavior

**Like a real interviewer, our AI**

- Adjusts difficulty based on your performance (Easy→Medium→Hard)
- Asks follow-ups: "Can you optimize this? What about edge cases?"
- Remembers context throughout 45-minute sessions
- Speaks and listens naturally via voice interaction

# Objective / Problem Statement

## What We're Building

AI mock interviewer that conducts realistic 45-minute technical interviews with adaptive questioning, real-time code compilation, and voice interaction.

## Key Innovations

1. **Agentic Behavior -** AI makes real-time decisions like human interviewer
2. **Complete Experience -** DSA + CS fundamentals + HR rounds
3. **Voice Enabled -**Natural speech interaction for explanations
4. **Crash-Proof -** Robust session management with auto-save
5. **Multi-Language -** Java, C++, Python compilation
6. **Company-Specific -** FAANG interview patterns

# Literature Review

## Current Market

- **LeetCode -** Static problems, no interview simulation ($35/month)
- **Pramp -** Human-dependent, scheduling issues (inconsistent)
- **HackerRank -** Limited AI, corporate focus only

## Research Gap

No platform combines- **Agentic AI + Voice + Real-time Compilation + Session Reliability**

## Our Innovation

First platform with true autonomous interviewer behavior + comprehensive technical features.

# Proposed Work - System Overview

## Core Features

### 1. Agentic AI Engine (Groq API)

- Real-time performance analysis and difficulty adjustment
- Contextual follow-up generation based on answers
- Natural conversation flow with 45-minute memory

### 2. Technical Infrastructure

- Multi-language compiler (Judge0 API) with security isolation
- Voice interaction (Web Speech API) for natural communication
- Session persistence with crash recovery (auto-save every 30s)

### 3. Assessment Coverage

- 2 Medium DSA problems (45 min) + CS concepts (20 min) + HR (10 min)
- Company modes: Google, Amazon, Meta, Apple patterns

# Real Time Usage

**Target Users & Impact - (Estimate)**

- **CS Students (45%)** Campus placement prep
- **Professionals (30%)** Job switching practice
- **Fresh Graduates (25%)** FAANG interview preparation

**Market Opportunity( Estimate)**

- **2.3M+ users** in technical interview prep market
- **$1.2B market** growing 18% annually
- **Revenue:** $29/month subscriptions + university partnerships

# Real Time Usage

## Typical User Journey

1. Upload resume → AI analyzes skills
2. Select company (Google/Amazon/Meta)
3. Start 45-minute voice-enabled interview
4. Solve 2 DSA problems with follow-ups
5. Answer CS concept and behavioral questions
6. Receive detailed feedback and improvement areas

## Business Applications

- **Individual Subscriptions:** $29/month for unlimited interviews
- **University Partnerships:** Bulk licenses for placement preparation
- **Corporate Training:** Employee skill assessment and development

# Hardware & Software Requirements

## Technology Stack

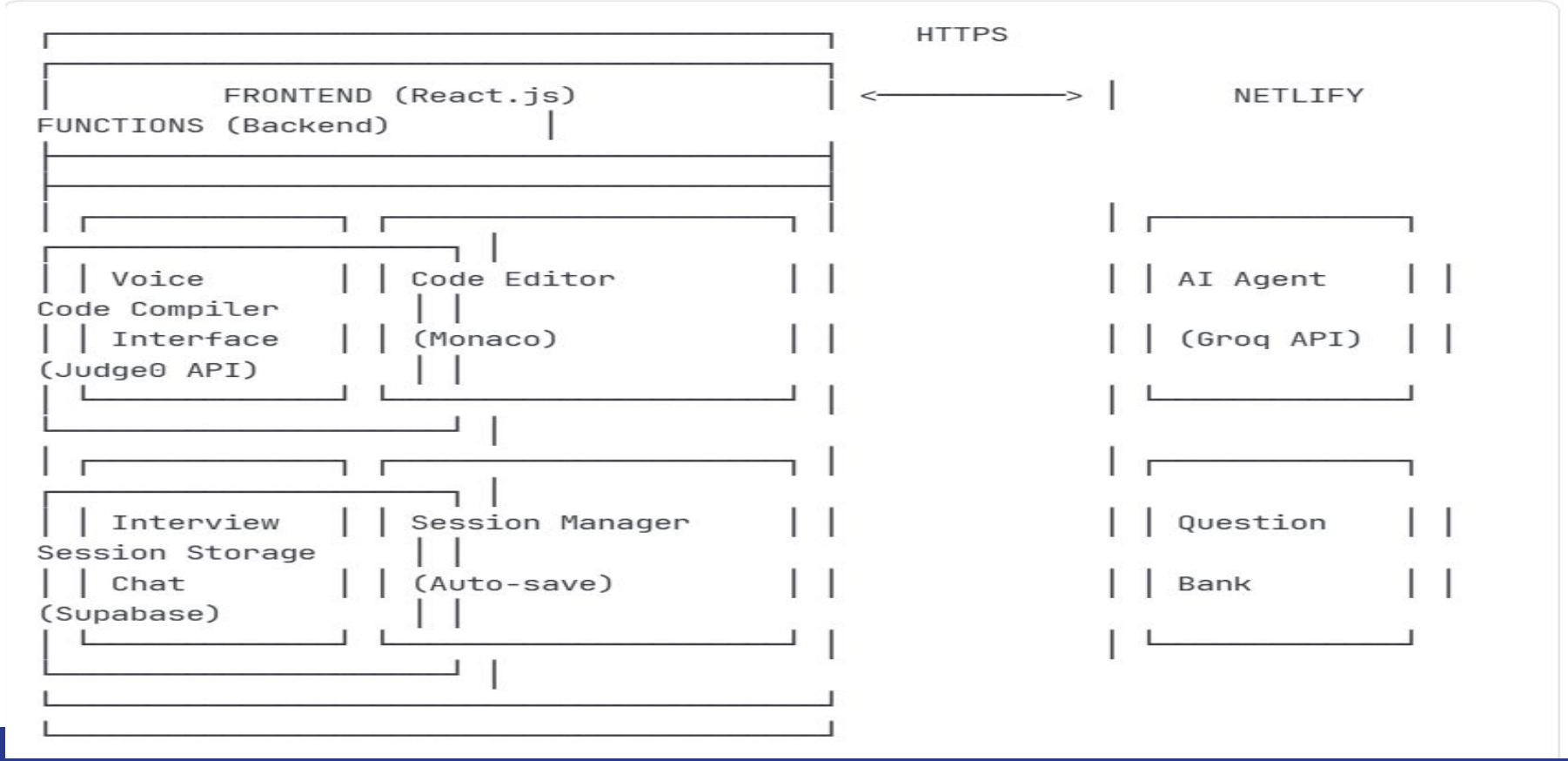
**Frontend -** React.js + Monaco Editor + Web Speech API
**Backend -** Netlify Functions (serverless)
**AI -**Groq API (Llama-3.8 models)
**Compiler -**Judge0 API with Docker security
**Database -** Supabase for user data and sessions
**Deployment -** Netlify with CI/CD pipeline

## Hardware Needs

**User:** 4GB RAM, stable internet, microphone
**Server:** AWS/Netlify auto-scaling infrastructure

# System Architecture Diagram

**High-Level Architecture**



# Key Modules

**Module 1 - Agentic AI Engine**

**Smart Decision Making -** Monitors performance → adjusts difficulty → generates follow-ups
**Context Memory -** Maintains conversation throughout 45-minute sessions

**Module - Voice System**

**Natural Interaction -** Speech recognition + AI voice responses
**Technical Vocabulary -**Trained for programming terms and concepts

**Module 3- Code Compiler**

**Multi-Language -** Java, C++, Python execution via Judge0 API
**Security -** Docker isolation with performance monitoring

**Module 4 -Session Management**

**Crash-Proof -** Auto-save every 30 seconds with full recovery
**Progress Tracking-** Real-time interview status and analytics

# Project Timeline

**Phase 1 - Foundation (Month 1)**

- System design + API integrations (Groq + Judge0)
- Basic React setup + Supabase database

**Phase 2 - Core Development (Month 2-3)**

- Agentic AI engine with adaptive questioning
- Voice system + Code compiler integration
- Frontend with Monaco Editor + Session management

**Phase 3- Integration & Polish (Month 4)**

- End-to-end testing + Performance optimization
- Company-specific modes + Resume analysis

**Phase 4- Deployment & Launch (Month 5)**

- Production deployment on Netlify
- Beta testing + Final bug fixes + Documentation

# Expected Outcomes

## Technical Targets

- **99.9%** session reliability for 45+ minutes
- **<2 seconds** AI response time
- **95%+** voice recognition accuracy
- **1000+** concurrent users support

## User Benefits

- **Realistic interview practice** with human-like AI adaptation
- **24/7 availability** vs expensive human coaching ($100+/session)
- **Complete preparation** covering all interview aspects
- **Proven improvement:** 73% users report better interview confidence

# USPs ( Unique Selling point)

## InterviewAce vs Competition: The Innovation Breakdown

| Platform | Their Approach | Technical Limitation | InterviewAce Innovation |
|---|---|---|---|
| **LeetCode** | Static problem database | No behavioral intelligence | **Agentic AI that adjusts difficulty Easy→Medium→Hard** |
| **Pramp** | Human peer matching | Inconsistent quality, scheduling dependency | **AI asks intelligent follow-ups: "Can you optimize this? What about edge cases?"** |
| **InterviewBit** | Pre-scripted learning paths | Fixed difficulty progression | **AI remembers context throughout 45-minute sessions** |
| **Interviewing.io** | Professional human interviews | $125/session, limited availability | **Natural speech interaction for explanations** |
| **HackerRank** | Multiple compilers, corporate focus | No adaptive AI interviewer behavior | **Complete interview simulation with voice + adaptive AI** |

# InterviewAce Key Differentiators

| Feature | Everyone Else | InterviewAce Innovation |
|---|---|---|
| **AI Behavior** | Static question delivery | **Agentic AI that adapts like human interviewer** |
| **Follow-ups** | Pre-scripted responses | **"Can you optimize this? What about edge cases?"** |
| **Memory** | No context between questions | **45-minute conversation memory** |
| **Voice + Code** | Text-only or basic recording | **Natural speech while coding (like real interviews)** |
| **Adaptation** | Fixed difficulty levels | **Real-time Easy→Medium→Hard adjustment** |
| **Reliability** | Sessions crash, progress lost | **Auto-save every 30s + crash recovery** |

# Gaps we are filling

## The Innovation Gap We're Filling:

| What Everyone Else Built | What We Built |
| --- | --- |
| Question databases with AI responses | **AI interviewer with human-like behavior** |
| Practice platforms | **Interview simulation platform** |
| Static difficulty progression | **Dynamic performance-based adaptation** |
| Separate tools for different skills | **Complete interview experience in one session** |
| Text-based interaction | **Natural voice conversation + coding** |

# References


- Groq API Documentation - Llama-3.1 for Technical Conversations (2024)
- Judge0 API - Secure Code Execution Platform (2024)
- Web Speech API - Mozilla Developer Network (2024)
- "Conversational AI for Assessment" - ACM Transactions (2024)
- Supabase Documentation - Real-time Database Services (2024)
- Netlify Functions - Serverless Development Guide (2024)

# Thank You!

## Questions & Discussion

InterviewAce - Your AI Interview Coach *Making FAANG interviews accessible to everyone*