ChatGPT

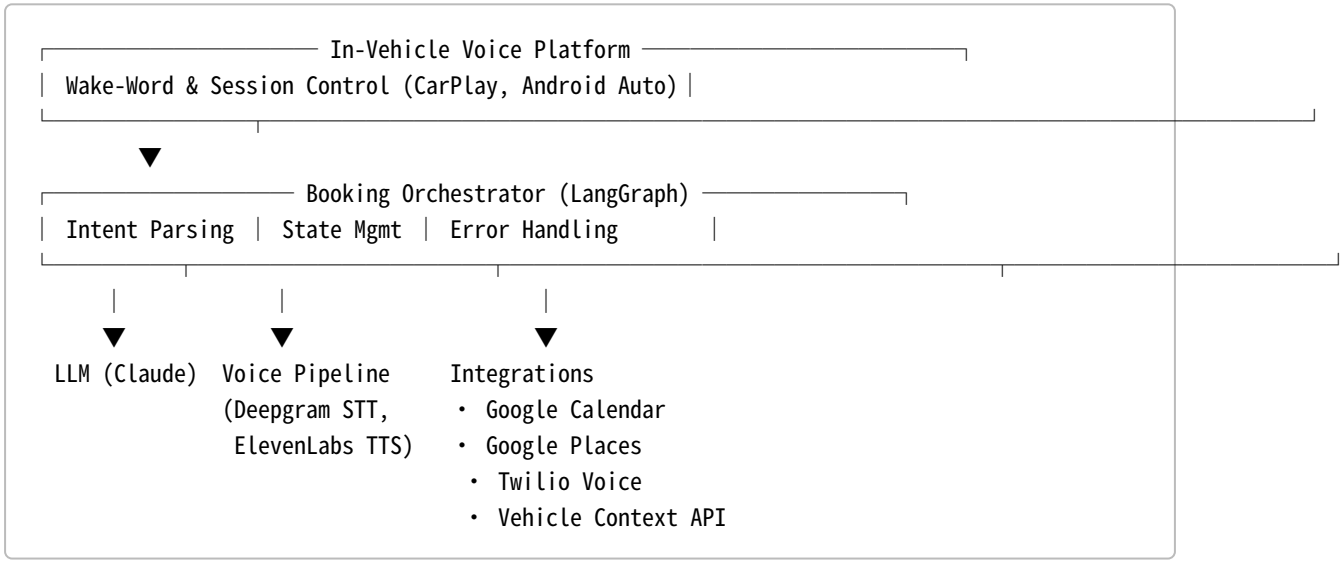
AI Voice Booking Agent for Drivers

Hands-Free Reservations on the Road

Slide 1: Customer Scenario & Rationale

- **Job to be done:** "As a driver, I want to book a table without taking my hands off the wheel."
- **Why voice in cars?** Hands-free voice assistants are legal and encouraged because they prevent drivers from handling phones [1]. They allow calls and texts via a mounted phone or smart car, helping drivers keep both hands on the wheel. A quality assistant must respond quickly, navigate smoothly and never require manual interaction [2].
- **User flow:** The driver says "Book a table for 4 at a sushi place next Friday at 7 pm," the agent checks the calendar, finds a restaurant, calls, confirms the booking and reads back the details—all through natural speech. A study on in-vehicle voice assistants found they improve driver alertness and reduce fatigue [3].

Slide 2: Technical Architecture



Driving-specific enhancements: Shorter conversation timeouts (<2 min), safe-prompt scheduling based on driving context, concise responses (<15 s), and wake-word invocation. The architecture adds a vehicle interface to obtain speed and road conditions, deferring prompts when the road is complex.

Slide 3: Technology & Orchestration Choices

Component	Choice	Rationale
LLM	Claude Sonnet 4.5	Fast tool-calling, long context window, reliable instruction following—critical for real-time voice.
STT	Deepgram Nova-2	300–500 ms latency, optimized for telephony and noisy environments.
TTS	ElevenLabs Turbo v2.5	Human-like prosody with streaming output, low latency.
Orchestration	LangGraph	Provides a state machine with conditional edges and error handling, suited for multi-step booking flows.
Telephony	Twilio Programmable Voice	Reliable outbound calling with WebSocket streaming and call status callbacks.

Tool-calling & integration: The agent uses function calling to check calendar availability, search for businesses and compute dates (e.g., “next Friday”). Each integration (Calendar, Places, Telephony) is encapsulated in a tool with its own error handling. Driving context is treated as another tool that informs when it is safe to speak.

Slide 4: MVP Implementation & Demo

- **Prototype program:** `driving_booking_agent.py` illustrates core functionality without external dependencies. It parses requests, invokes a date-calculation tool, checks calendar and business availability (mocked) and conducts a brief conversation with a simulated receptionist.
- **Error handling:** Detects invalid time (“25 pm”), prompts for clarification and retries. Maintains short prompts and summarises the confirmed booking in one sentence.
- **Demonstration:** Running the script shows the agent resolving an ambiguous request, selecting a restaurant and confirming a table—all with concise exchanges suitable for driving. Replace the mocked functions with real API calls to extend this to a full POC.
- **AI coding assistants:** Claude Code and Copilot were used to generate initial class scaffolds, conversation logic and tests; their output was manually reviewed, refined, and documented. IDE tools (e.g., VS Code) assisted in debugging and type hinting.

Slide 5: Next Steps & Enhancements

- **Complete integrations:** Swap mocked calendar and business search for Google Calendar and Google Places APIs; integrate Twilio for real calls.
- **Contextual awareness:** Use vehicle sensors to delay prompts during complex driving maneuvers; implement dynamic speech rate based on road conditions.
- **Multi-service concierge:** Extend beyond restaurants—book parking, ride services or appointments. Provide proactive suggestions based on calendar and location.
- **Language & accessibility:** Add multilingual support and options for hearing-impaired users.
- **Evaluation:** Conduct driving simulator studies to measure workload, reaction time and conversation quality. Aim for a task completion rate >85 % and average prompt length <15 s.

Thank you!
Ready to discuss implementation details, safety considerations and future enhancements.

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1 2 Is It Legal to Use a Voice Assistant While Driving?
https://www.makeuseof.com/is-it-legal-to-use-a-voice-assistant-while-driving/

3 Exploring the effectiveness of a digital voice assistant to maintain driver alertness in partially automated vehicles - PubMed
https://pubmed.ncbi.nlm.nih.gov/33881365/