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Learning Style: Virtual Classroom

Technology:

Difficulty: Beginner

Course Duration: 3 Hours

Voice Bots in Action (TTAI2063)

About This Course:

This half-day course is designed for developers, product managers, and business innovators who want to build practical skills in voice-enabled AI technologies. The course provides a step-by-step guide to creating a voice bot that interacts naturally with users, similar to assistants like Alexa or Siri. Participants will gain hands-on

experience with speech recognition, natural language processing, and response generation, ending with a working voice bot prototype you can test.

Course Objectives:

- Get Started with Voice Bots: Understand the basics of voice bot technology and how popular systems like Alexa and Siri work.
- Voice Recognition Basics: See how voice recognition turns speech into text and how to use it in your own projects.
- Integrating Natural Language Processing (NLP): Use natural language processing to interpret what users say and generate useful responses.
- Developing a Conversational AI: Explore how to design a bot that feels more natural and human when talking with people.
- Create Your First Bot: Go step by step through building a simple voice bot.
- Make It Your Own: Customize bot interactions to match business goals or personal needs.
- Find New Uses: Identify opportunities to apply voice AI in customer service, operations, and user experiences.

Audience:

- This introductory-level course is for developers, product managers, and business innovators who want to explore how voice assistants work and how voice AI can be used in real products and services.

Prerequisites:

- Familiarity with any programming language (such as Python or JavaScript) is helpful but not strictly required.

Course Outline:

1) Voice Bots 101: The Basics

An introduction to Voice AI and how it compares to traditional chatbots and graphical user interfaces. Real-world examples from customer service, digital assistants, automotive systems, and IoT illustrate why voice interfaces are becoming a standard. Core ideas such as intents and slots are explained, along with common challenges like latency, barge-in, fallback handling, and safety,

providing the foundation for the rest of the course.

- Recognize common use cases for Voice AI
- Define intents and slots
- Understand challenges unique to spoken interaction

2) The Voice Bot Pipeline

Walk through the full pipeline that powers a voice bot. See how speech is captured with Speech to Text, interpreted by Natural Language Understanding, routed through a dialogue policy, and spoken back using Text to Speech. The tradeoffs between rule-based NLU and modern LLM-driven approaches are introduced, showing where each approach fits. Key technical hurdles such as latency, handling interruptions, and safe fallback behaviors are also explained.

- Explain the main pipeline stages
- Compare rule-based vs LLM-driven NLU
- Recognize real-world interaction challenges

3) Building and Extending Your Bot

With the basics established, now let’s make bots useful. Intents like calculators, jokes, or fact queries are added, and slot-filling is demonstrated through examples such as capturing a city or number. A timer intent illustrates how a bot can control actions and deliver alerts. To showcase real-world power, learners see how to connect external APIs, like a weather service, and transform the results into natural spoken responses.

- Add new intents to the pipeline
- Capture slots for functional use
- Connect to external APIs and deliver testable bot behaviors

4) Voice UX and Personalization

Beyond the mechanics, bots must feel natural and engaging. Explore how to design conversations that fit user expectations. Topics include setting tone and style,

providing confirmations, recovering from errors, and maintaining conversational flow. Personalization strategies such as adapting to context or tailoring responses are highlighted as ways to increase adoption and user satisfaction.

- Apply user-centered design to voice interfaces
- Explore personalization strategies
- Design fallback and error recovery patterns

5) Quality, Safety, and Ethics

A voice bot needs to be reliable and responsible. Learners discover how cloud-based STT and TTS can improve voice quality, and how to implement safety guardrails such as profanity filters, maximum response length, and restricted reply options. The discussion then expands to ethics, covering privacy, data protection, and fairness in AI, showing why these considerations are essential before deploying bots at scale.

- Enhance speech quality using external providers
- Implement safety guardrails
- Identify ethical risks and data protection needs

6) Looking Ahead

Look toward the future of voice AI, introducing emerging trends such as real-time LLMs, multimodal systems that combine voice with vision, and the growing use of voice in everyday products and services.

- Explore upcoming trends in voice AI
- Identify opportunities for innovation in real products and services