Chatbot with ChatGPT API

▼ OFFICIAL OUTLINE:

1. **API:**

   1.1. What is API

   1.2. General Usage

2. **Chatbots:**

   ▼ **2.1. Definition:**

   software program that stimulate conversation with human user

   ▼ **2.2. Classification:**

   - Rule-based: respond to specific keywords or phrases
   - AI-based: ML algo to analyze input and generate responses

   ▼ **2.3. Usage:**

   - customer service: resolve issues and answer questions quickly
   - marketing and sales: product recommendations, handle online orders + payments, collect customer feedback
   - education and training: personalized training resources, language learning. Explanations, examples, interactive quiz, retain material
   - personal assist: scheduling appointment, make reservation, set reminders
   - Mental health: emotional and mental health resource
   - recipe recommendation: preference-based, dietary restrict, ingredients
   - news aggregator: summarize + update news
   - travel assist: find flights, hotels, attraction,…
   - personal finance: personal advice + common questions answers

- job search: seek postings and personalized advice, optimize resume, prepare for interview
- fitness: fitness advice, track progress sg workout
- game recommendation
- language translation
- Legal chatbot: Create a chatbot that can provide legal advice and guidance to users.
- Music recommendation chatbot: Build a chatbot that can suggest new music based on user preferences and listening history

▼ 2.4. Pros and cons:

Pros	Cons
Cost-effectiveness: operate 24/7, handle large amount of request	Unnaturally replicating human conversation: Struggle to understand and respond certain input ⇒ can't handle complex or unpredictable scenarios
Convenience: Immediate access to in4 ⇒ no waiting	
Scalability	

▼ 🔑 To get the most of chatbot:

- design effect conversation flow:
  - use clear, concise language
  - provide multiple response options
  - use relevant, timely prompts
- handle common challenges
  - have a strict rule sets and responses
  - have a system for tracking and analyzing user inputs
- integrate into systems and processes
  - integrate into CRM systems or other database

        - automate tasks and processes
        - ensure chatbot's interaction with human representatives and other systems
        - implement chatbot according to business goals and objectives

3. **ChatGPT:**
    - ▼ **3.1. Definition**
    - ▼ **3.2. Capabilities**
        - generate coherent and relevant responses to user inputs
        - integrate with a variety of chatbot platforms and frameworks such as, Facebook Messenger, Slack, and Telegram,…
        - offer many advanced features to further enhance the capabilities of chatbot such as fine-tuned, name entity recognition, sentiment analysis
    - ▼ **3.3. About ChatGPT API**
    - ▼ **3.4. How to use ChatGPT API Key**
4. **Building chatbot using chatGPT API:**
    - ▼ 4**.1. Choose chatbot platform:**
        - consider the chatbot's goals, types of inputs and responses
        - consider target audience and distribution channels (chatbot for e-commerce ⇒ platform integrated with e-com/payment systems)
        - research and evaluate potential chatbot platforms. Consider:
            - features and capabilities
            - level of integration with others sys and apps
            - level of customization and control available
            - cost and pricing
            - level of support and documentation provided
    - ▼ 4**.2. Integrate chat GPT with platform**

- install chat GPT package

  ✅ Requirements:

  - ≥ Python 3.6
  - PyTorch library
  - Obtain API Key

  ✅ Install Chat GPT package by open terminal and enter:

  ```
  pip install chat-gpt
  ```

- configure API key
- integrate chat GPT with platform's API / SDK.

⇒ Read specifically in the platform's documentation about integrate natural language processing tool

▼ 4**.3. Create chatbot scripts and training data**

- Create chatbot scripts:
  - define the goals of chatbot ⇒ determine types of inputs and responses
  - create a series of prompts and responses to define conversation flow and chatbot's content
- Create training data:
  - collect many user inputs and responses relevant to the chatbot's objectives:
    - manually create large datasets: write out series of inputs and responses / use chatbot platform to simulate conversation
    - use existing data sources like customer service logs / online forums: extract inputs and responses and organize into dataset

📍 **Caution**:

- Pay attention to the quality and relevance of the training data
- often review and update script and training data

▼ 4**.4. Test and improve**

- use chat GPT API to train the chatbot on the training data
- **Test chatbot:**
  - Identify test cases
  - Set up test environment (hardware, software, data)
  - Run tests and collect results
  - Evaluate results of the test cases and compare to expected results
  - Identify issues and bugs
- **Debug chatbot:**
  - Review code and identify potential issues or bugs
  - Use debugging tools and techniques (print statements/breakpoints) ⇒ identify root cause
  - Fix the issue/bug by modifying code
- adjust and retrain if needed until reach desired level

5. **Other movement towards the created chatbot:**

▼ **5.1. Incorporating Natural Language Processing and ML Techniques**

✅ **Purpose:** make chatbot understand and respond to wide range of inputs more accurate and relevant.

- **Define the chatbot's goals and needed NLP/ML techniques**
- **Research and evaluate NLP/ML techniques:**
  - reviewing academic literature
  - testing different techniques
  - consulting with experts

⇒ define the NLP/ML techniques used

- **Integrate the techniques into chatbot:**
  - modify scripts and training data to incorporate the techniques
  - configure and optimize the chatbot's model
  - adjust and retrain if needed until reach desired level

▼ 5.2. Using Pre-Trained Models and Fine-Tuning for specific tasks

✅ **Purpose**: speed up the development process and improve performance

- Identify chatbot's goals and types of pre-trained models
- Research and evaluate relevant pre-trained models and tasks
  - reviewing academic literature
  - testing different techniques
  - consulting with experts
- Download and install the models and tasks: from online respositories or purchase them from vendors
- Fine-tune the models and tasks for the specific chatbot tasks

▼ 5.3. Adding custom functionality and integrations to chatbots:

✅ **Purpose:** enhance chatbot's capabilities and allow additional value to user

- Identify goals and types of custom functionality
- Research and evaluate relevant functionality and integrations
- Integrate into the chatbot:
  - modify scripts and training data
  - configure necessary APIs or integrations
- Test and evaluate performance
- Adjust scripts and data then retest until reach desired level

✅ **Example:**

- **Payment processing:** allowed to facilitate transactions and handle payments ⇒ E-commerce
- **Data integration:** allowed to access and use data from these sources. (weather API integrated chatbot can give up-to-date weather in4)
- **Social media integration:** allowed to interact with users on media platforms and access user data ⇒ Marketing / customer service
- **Custom analytics:** allowed to track and analyze user interactions and behaviors, provide insights and recommendations consequently ⇒ Healthcare, finance (data-driven industries)
- Custom visualization: allowed to generate and display charts, graphs, … ⇒ Finance, Business

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▼ BOOK'S RAW SUMMARY

▼ Section 1. Chatbots:

▼ ✅ Definition:

software program that stimulate conversation with human user

▼ ✅ Classification:

- Rule-based: respond to specific keywords or phrases
- AI-based: ML algo to analyze input and generate responses

▼ ✅ Usage:

- customer service: resolve issues and answer questions quickly

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▼ ✅ Pros and cons:

Pros	Cons
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- design effect conversation flow:
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- handle common challenges
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  - have a system for tracking and analyzing user inputs
- integrate into systems and processes
  - integrate into CRM systems or other database
  - automate tasks and processes
  - ensure chatbot's interaction with human representatives and other systems
  - implement chatbot according to business goals and objectives

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▼ Section 2. ChatGPT

▼ ✅ Capabilities:

- generate coherent and relevant responses to user inputs
- integrate with a variety of chatbot platforms and frameworks such as, Facebook Messenger, Slack, and Telegram,…
- offer many advanced features to further enhance the capabilities of chatbot such as fine-tuned, name entity recognition, sentiment analysis

▼ I. Set up ChatGPT chatbot:

▼ I.1. Installing and Configuring chat GPT:

1.1. Requirements:

- ≥ Python 3.6
- PyTorch library
- Obtain API Key

1.2. Install Chat GPT package by open terminal and enter:

```
pip install chat-gpt
```

1.3. Configure the API key within the chatbot platform console.

1.4 Create chatbot script and training data

- Create chatbot scripts:
  - define the goals of chatbot ⇒ determine types of inputs and responses
  - create a series of prompts and responses to define conversation flow and chatbot's content
- Create training data:
  - collect many user inputs and responses relevant to the chatbot's objectives

▼ I.2. Choose chatbot platform and Integrating Chat GPT:

2.1. Narrow down choices:

- consider the chatbot's goals, types of inputs and responses
- consider target audience and distribution channels (chatbot for e-commerce ⇒ platform integrated with e-com/payment systems)
- research and evaluate potential chatbot platforms. Consider:
  - features and capabilities
  - level of integration with others sys and apps
  - level of customization and control available

- cost and pricing
- level of support and documentation provided

2.2. Integrate chat GPT with platform”

- install chat GPT package
- configure API key
- integrate chat GPT with platform’s API / SDK.

⇒ Read specifically in the platform’s documentation about integrate natural language processing tool

2.3. Create chatbot scripts and training data

2.4. Test and improve:

- use chat GPT API to train the chatbot on the training data
- test performance by giving many user inputs ⇒ evaluate responses
- adjust and retrain if needed until reach desired level

▼ II. Building a Chatbot with ChatGPT:

▼ II.1. Create Chatbot scripts and training data:

- Create chatbot scripts:
  - define the goals of chatbot ⇒ determine types of inputs and responses
  - create a series of prompts and responses to define conversation flow and chatbot’s content
- Create training data:
  - collect many user inputs and responses relevant to the chatbot’s objectives:
    - manually create large datasets: write out series of inputs and responses / use chatbot platform to simulate conversation

        - use existing data sources like customer service logs / online forums: extract inputs and responses and organize into dataset

📍 **Caution**:

- Pay attention to the quality and relevance of the training data
- often review and update script and training data

▼ II.2. Use ChatGPT to generate Responses and improve the chatbot's performance:

After creating the scripts and training data:

- Install and configure the ChatGPT package and obtain API key
- Train the chat bot on the training data using the Chat GPT API
- Test chatbot's performance by providing inputs and evaluating the responses
- Adjust and retrain if needed until reach desired level

▼ II.3. Test and Debug the chatbot:

3.1. Test chatbot:

- Identify test cases
- Set up test environment (hardware, software, data)
- Run tests and collect results
- Evaluate results of the test cases and compare to expected results
- Identify issues and bugs

3.2. Debug chatbot:

- Review code and identify potential issues or bugs
- Use debugging tools and techniques (print statements/breakpoints) ⇒ identify root cause
- Fix the issue/bug by modifying code
- Retest

▼ III. Advanced Techniques for building chatbots with chat GPT:

▼ III.1. Incorporating Natural Language Processing and ML Techniques

✅ **Purpose:** make chatbot understand and respond to wide range of inputs more accurate and relevant.

1.1. Define the chatbot's goals and needed NLP/ML techniques

1.2. Research and evaluate NLP/ML techniques:

- reviewing academic literature
- testing different techniques
- consulting with experts

⇒ define the NLP/ML techniques used

1.3. Integrate the techniques into chatbot:

- modify scripts and training data to incorporate the techniques
- configure and optimize the chatbot's model
- adjust and retrain if needed until reach desired level

▼ III.2. Using Pre-Trained Models and Fine-Tuning for specific tasks

✅ **Purpose**: speed up the development process and improve performance

2.1. Identify chatbot's goals and types of pre-trained models

2.2. Research and evaluate relevant pre-trained models and tasks

- reviewing academic literature
- testing different techniques
- consulting with experts

2.3. Download and install the models and tasks: from online respositories or purchase them from vendors

2.4. Fine-tune the models and tasks for the specific chatbot tasks

▼ III.3. Adding custom functionality and integrations to chatbots:

✅ **Purpose:** enhance chatbot's capabilities and allow additional value to user

3.1. Identify goals and types of custom functionality

3.2. Research and evaluate relevant functionality and integrations

3.3. Integrate into the chatbot:

- modify scripts and training data
- configure necessary APIs or integrations

3.4. Test and evaluate performance

3.5. Adjust scripts and data then retest until reach desired level

✅ **Example:**

- **Payment processing:** allowed to facilitate transactions and handle payments ⇒ E-commerce
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- Custom visualization: allowed to generate and display charts, graphs, … ⇒ Finance, Business

▼ IV. Best practices for building chatbots with chat GPT

▼ IV.1. Tips for designing an effective chatbot conversation flow

1.1. Identify goals and types of conversations/interactions

1.2. Research and evaluate different conversation flows, interaction patterns

- reviewing academic literature
- testing different conversation flows and interaction patterns
- consulting with experts

1.3. Design script and training data

- creating specific responses and actions in different scenarios
- organizing script and training data in logical and coherent way

1.4. Testing and considering user's experience with the flow

- natural language processing
- personalized responses
- error handling

⇒ create a seamless and engaging user experience

▼ IV.2. Handling chatbot challenges

✅ Deal with uncertainty:

1. Identify uncertainty's source in script / training data:
   - Review the chatbot's goals
   - identify types of ambiguous inputs and scenarios
2. Design script and training data to address uncertainty
   - create specific responses, actions in uncertain scenarios
   - incorporate natural language processing techniques
3. Test and evaluate:
   - identify test cases to evaluate
   - set up test environment (hardware, software and data)

- run cases → collect results
- evaluate results of the test cases → compare to expected results
- identify issues / bugs during the testing process

4. adjust and retest until reach desired level

✅ Other methods:

- Integrate error handling tools
- Leverage natural language processing
- Review and update scripts, training data regularly