

# The Psychologist Dog: A Personality Analysis Chatbot System

Project Owner: Leali Marco | Course Organizer: Staffan Larsson

University of Gothenburg | Department of Philosophy, Linguistics and Theory of Science |  
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[guslealma@student.gu.se](mailto:guslealma@student.gu.se)

## Abstract

This paper presents "The Psychologist Dog": an interactive personality analysis chatbot that engages users in psychological questioning to determine personality archetypes and provide personalized recommendations. The system combines voice interaction with AI driven analysis through a state machine architecture integrating Ollama LLM API with Azure Speech Services. The chatbot demonstrates capabilities in multi-turn dialogue management, archetype detection from user statements and context-aware recommendation delivery.

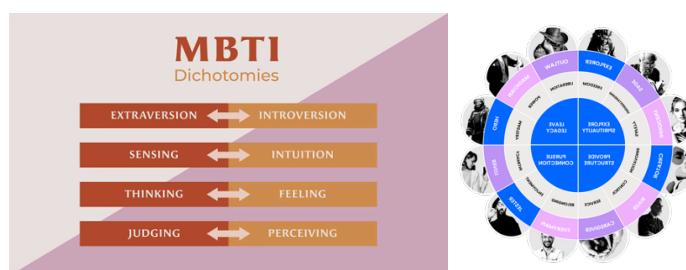
## 1. Introduction

"The Psychologist Dog" is a friendly personality analysis chatbot that engages users in psychological questioning to determine their personality archetype and provides personalized recommendations based on the detected archetype. The system has three main functions:

1. Psychological Investigation 🧠 - Engaging users in structured questioning to understand personality patterns
2. Personalized Recommendations 📚🎬 - Providing tailored suggestions based on detected archetypes
3. Chatty Chat 💬 - Maintaining engaging dialogue while gathering psychological insights

Unlike traditional personality tests that rely on fixed questionnaires, "The Psychologist Dog" adapts to user responses, allowing for both quick archetype detection from spontaneous statements and extended psychological assessment through guided questioning.

As parameters for the psychological analysis, The Myers-Briggs Type Indicator (MBTI) and 12 Jungian Archetypes have been taken into account. MBTI is a personality framework that categorizes people into 16 types based on how they perceive the world and make decisions, using four dimensions like introversion vs. extroversion, the The 12 Jungian Archetypes are universal character models (like the Hero, the Explorer, or the Caregiver) that describe recurring patterns of behavior and motivation found across cultures and stories.



Why a dog? Because using a realistic human face for a psychological advice system can create a false sense of authority and emotional intimacy, leading users to overtrust the AI as if it were a real therapist. This is especially risky given the uncanny valley effect, where almost-human AI can feel unsettling yet still appear credible enough to manipulate trust. By using a dog, clearly non-human and playful, I make psychologically aware the user that this system is more a game and not a substitute for

real psychological help, avoiding the psychological risks of misleading closeness or emotional dependence on AI.

## 2. System Architecture and APIs

The system is built on a Node.js with TypeScript foundation, integrating multiple specialized services:

- Ollama LLM API: The system utilizes the llama3.1 model for local language processing.
- Azure Speech Services: Provides robust speech-to-text and text-to-speech capabilities.
- Custom Psychology Engine: A rule-based pattern matching system that analyzes user statements against 12 predefined personality archetypes. This engine operates alongside the LLM to provide consistent archetype detection.

## 3. Challenges

The development process revealed several significant challenges in creating an effective personality analysis dialogue system:

- Common question-answer patterns in psychology questioning
- How to assign the archetype/MTBI personality
- How users naturally describe their preferences (timing, tone, etc.)
- Archetype revelation preferences (direct vs. gradual)
- Recommendation request patterns
- Handling of misunderstandings or vague answers

## 4. Implementation

### 4.1 Core Functions and Actors

The system implements several key functional components.

#### Primary Functions

detectArchetypeFromStatement(): Rule-based archetype detection using keyword scoring

getArchetypeRecommendations(): Curated suggestions mapped to personality types

fetchLLM(): Manages communication with the Ollama API

Intent recognition functions for recommendation requests, personal information sharing and archetype inquiries

#### System Actors

chatCompletion: Handles LLM-based conversation generation

analyzeMBTI: Processes psychological assessment data

generateGeneralRecommendations: Creates personalized suggestions

analyzeGeneralFromStatement: Provides quick archetype analysis

### 4.2 Dialogue Management

The Dialogue Management system uses a state machine architecture (Xstate) with the following states:

- Prepare: Initializes speech services
- Idle: Waits for user initiation
- Loop: Manages core conversation flow with sub-states for Speaking, Ask and specialized handlers
- Analysis States: Handle personality assessment and recommendation generation

The system employs context-aware responses that maintain conversation history and user profiles, enabling personalized interactions across multiple dialogue turns.

-  PRIORITY 1: Exit command
-  PRIORITY 2: Restart commands

- 🌟 PRIORITY 3: Recommendation requests
- 💬 PRIORITY 4: Personal info with archetype questions (ONLY when answerCount = 0)
- 🧠 PRIORITY 5: Personal info shared (MOST IMPORTANT FOR "I like music") - ONLY when answerCount = 0
- 🎨 PRIORITY 6: Archetype list requests
- 🎶 PRIORITY 7: Handle requests for archetype-specific recommendations
- ✅ PRIORITY 8: Normal input LAST (fallback) - This now captures "I love/I like" after first interaction

### 4.3 User Interaction Flow

The system supports multiple interaction patterns:

- Quick Archetype Detection: Users can immediately share interests ("I love hiking") for instant personality assessment
- Guided Questioning: Sequential psychology questions for comprehensive analysis
- Direct Requests: Specific queries for recommendations or archetype information
- Mixed Initiative: Flexible transitions between questioning, analysis, and recommendation phases

## 5. Sample Dialogues and System Capabilities

### 🧠 Dialogue A: Efficient Archetype Detection

🐶: Hi, tell me what you love and I will guess who you are. Or I will make you questions.

👤: I enjoy organizing team projects and making decisions

🐶: Based on you saying "I enjoy organizing team projects and making decisions", I detect you might be the "The Ruler" archetype! Key traits: organized, leadership. Would you like recommendations or to continue exploring?

### 🧠 Dialogue B: Psychology Question Flow

🐶: Hi, tell me what you love and I will guess who you are. Or I will make you questions.

👤: I really like New York City

🐶: The energy of the city seems to draw you in. Do you feel most alive when surrounded by other people or is it more of a solo experience for you?

👤: I really love soul experiences.

🐶: You're someone who values depth and authenticity in your relationships and experiences. You likely prioritize meaningful connections over superficial ones. How do you handle being around people who don't share the same level of emotional openness as you?

👤: I really like, uh, mini meaningful, umm, relationships

🐶: Based on our 3 questions, I believe you are The Lover. This suggests you're naturally passionate, appreciative. As a The Lover, you might enjoy "Pride and Prejudice", "The Notebook", or Cooking for loved ones. How does that resonate with you?

### 📚 Dialogue C: Psychology + Recommendation

🐶: Hi, tell me what you love and I will guess who you are. Or I will make you questions.

👤: I love hiking.

🐶: Based on you saying "I love hiking", I detect you might be the "The Lover" archetype! Key traits: nature-loving, outdoorsy, romantic, loving. Would you like recommendations or to continue exploring?

👤: Yeah, give me one book recommendation.

🐶: "The Seven Husbands of Evelyn Hugo" by Taylor Jenkins Reid is a heartwarming and engaging novel about the life of reclusive Hollywood star Evelyn Hugo, and her seven marriages to men who all had secrets that shaped her life in unexpected ways. This book combines elements of drama,

romance, and social justice, making it a captivating read for anyone looking for a story with depth and relatability.

## 6. Discussion

### 6.1 Demonstrated Capabilities

- Multi-turn Questioning: Maintaining context across psychology question sequences
- Immediate Archetype Detection: Quick personality assessment from user statements
- Personalized Recommendations: Context-aware suggestion generation
- Natural Transitions: Smooth movement between questioning, analysis, and recommendation phases
- Conversation Management: Handling restart, quit, and error recovery scenarios

### 6.2 Identified Limitations

- Over-eager Analysis: The system sometimes detects archetypes prematurely from minimal information, leading to unstable and unpredictable assessments. This reflects the tension between responsive interaction and analytical accuracy.
- Question Flow Rigidity: The fixed sequence of psychology questions can feel mechanical compared to human conversational patterns. Adaptive questioning based on user responses remains an area for improvement.
- Recommendation Timing: Balancing when to offer recommendations versus waiting for explicit user requests presents ongoing challenges in dialogue strategy.
- Natural Language Variation: Handling the diverse ways users express similar preferences and personality traits requires more sophisticated linguistic analysis.

## 7. Future Work

Several directions for system enhancement have been identified:

- Data Collection and Integration
  - o Expanded Dialogue Collection: Gathering more human-human personality assessment dialogues to refine conversation patterns
  - o External API Integration: Incorporating services like DevilAI or 16personality APIs for complementary assessment approaches
  - o MBTI Dataset Integration: Leveraging established psychological datasets for improved archetype mapping
- Enhanced Natural Language Understanding
  - o Sophisticated Intent Recognition: Improving detection recognition
  - o Sentiment Analysis: Incorporating emotional tone analysis for better response tailoring
  - o Ambiguity Resolution: Enhanced handling of vague or contradictory user statements
- System Improvements
  - o Adaptive Question Selection: Dynamic question sequencing based on user responses and engagement levels
  - o Debug-fixing: some functions are defined and not correctly used so they can be better integrated
  - o Improved Engagement Strategies: Techniques to maintain user interest throughout personality discovery
  - o Recommendation Specificity: Enhanced detail and personalization in suggested content
  - o Transition Optimization: Smoother movement between assessment phases
- Extended Capabilities
  - o Real-time Recommendation Updates: Dynamic suggestion refinement based on user feedback
  - o External Service Integration: Connections to platforms like Spotify for music recommendations