

Sea Turtle Conservation AI Project

Part #1

EEL3872

Jay Rosen

Abstract

This study explores the development and training of "Cammy," an AI chatbot, aimed at educating the community about sea turtle conservation. Developed at CogBot University, Cammy was trained using a collection of 50 frequently asked questions about sea turtles, sourced from community inquiries. The questions covered various aspects of sea turtle life, including their lifespan, size, and conservation practices. Training involved a ranking system for answers based on correctness and relevance, leveraging Natural Language Processing to improve response accuracy over time. The research utilized reputable sources like NOAA, National Geographic, and Sea Turtles Organization for initial information, complemented by insights from popular AI chatbots, ChatGPT and Google Gemini, to enhance Cammy's knowledge base. The study highlights the effectiveness of using generative AI models for environmental education, albeit with challenges such as specificity of questions, typo sensitivity, and potential biases in data sources. Additionally, the research underscores the importance of human oversight in AI training, particularly in maintaining the diversity and quality of knowledge. Cammy's training also integrated user-friendly features like multimedia responses and external search capabilities, although some features like voice recognition were not functional. The study suggests that AI chatbots can be valuable tools for environmental education, with potential for continuous learning and improvement through community interaction and human curation.

Introduction

In the face of escalating environmental challenges endangering wildlife, innovative solutions like AI can engage and educate the global community on conservation efforts. This study introduces "Cammy," an AI-powered chatbot developed at CogBot University, designed to bridge the gap between scientific knowledge and public interest in sea turtle conservation. By leveraging the capabilities of AI, Cammy aims to provide an interactive platform that not only disseminates valuable information about sea turtles—a group of species increasingly threatened by human

activities and environmental changes—but also fosters a deeper understanding and engagement among individuals regarding the conservation of these marine creatures.

Problem Statement

Despite growing awareness and conservation efforts, sea turtles continue to face significant threats from habitat destruction, climate change, poaching, and pollution. Public education and engagement are crucial in mitigating these threats, yet traditional methods of environmental education often struggle with accessibility, engagement, and scalability. The challenge lies in effectively leveraging technology to bridge the knowledge gap between scientific communities and the public, providing accurate, accessible, and engaging information about sea turtle conservation. This study addresses the need for innovative educational tools by exploring the potential of AI chatbots, specifically Cammy, in disseminating crucial conservation information, answering common queries, and engaging the community in sea turtle preservation efforts. The effectiveness, adaptability, and potential biases of AI-driven educational platforms are critical aspects that this study aims to investigate, with the goal of enhancing public awareness and participation in sea turtle conservation.

The screenshot displays the CogUniversity interface, featuring a navigation sidebar on the left with links to Home, Classrooms, Library, Operations, Research & Development, Administration, Show Campus Map, and Logout. The main content area shows a chatbot conversation with Cammy (uf_0002). The chat history includes two messages from Jay Rosen (JR) and two responses from Cammy. The first response, labeled 'Answer 1', states that sea turtles come in a range of sizes, from 2 feet long to 6 feet long, and weigh over 1,000 pounds. The second response, labeled 'Answer 2', states that as of May 2023, scientists estimate that there are about 6.5 million sea turtles left in the wild, with the hawksbill turtle population estimated to be between 83,000 and 57,000. The interface also includes a 'Start Chat' button, a 'Submit Ranks' button, an 'Add Better Answer' button, and a 'Close' button. The footer contains the 'future of life' logo, a 'Terms of use' link, and a copyright notice for Cogability, Inc.

CogUniversity® UF Campus 0 days remaining in the term United States - English Cammy (uf_0002) Start Chat

1. how many sea turtles are there JR Jay Rosen 03/02/24

> Answer 1 ★★★★★
Sea turtles come in a range of sizes! The smallest sea turtles are around 2 feet long, while the biggest, the leatherback, can grow up to 6 feet and weigh over 1,000 pounds!
RapidTrain (Major DML) Expiration date: 02/28/25 Extend

JR Jay Rosen

> Answer 2 ★★★★★
As of May 2023, scientists estimate that there are about 6.5 million sea turtles left in the wild. However, the exact number varies by species. For example, the hawksbill turtle population is estimated to be between 83,000 and 57,000. Other species
...
RapidTrain (Major DML) Expiration date: 03/01/25 Extend

Submit Ranks Add Better Answer Close

future of life
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Methodology

To start, we gathered a collection of 50 questions from the community about Sea Turtles, such as how long they live, how large can they be, and preservation questions regarding how to observe them safely. As each question was answered, the CogBot AI would be trained using a ranking system. As more questions were answered over time, previous answers would be called upon from the AI's memory and Natural Language Processing deciphering the question. The answers that Cammy would provide would be ranked again given on scale of 1 -5, given the correctness or incorrectness of the given answer to the context of the individual questions. Many of the questions were similar, so Cammy was able to answer correctly from the previous correct responses. Cammy would answer incorrectly when a question was too specific or not at all related to the original questions that Cammy was trained on. Most likely it is individual words or phrases that the AI is looking up to quickly make its response. If a question is mistyped or words are misspelled, the chatbot has less accuracy at answering the question properly, which also suggest its unable to process bad data into cleaned data before making its predicted answer.

The screenshot displays a chatbot interface with two questions and their corresponding answers. Each question is followed by a user profile (JR, Jay Rosen, 02/28/24) and a green checkmark icon. The first question is "4. How deep can sea turtles swim" and the second is "5. What is the max depth a sea turtle can go". Below the questions, there are two answer sections. The first answer section is titled "Answer 1" with a star rating of 4 stars. The text of the answer is "Once hatched, the turtles find their way to the ocean via the downward slope of the beach and the reflections of the moon and stars on the water." Below the answer text is a button labeled "RapidTrain (Major DML)". The second answer section is titled "Answer 2" with a star rating of 5 stars. The text of the answer is "Most turtles can dive to depths of up to 290 m (960 ft). However, one species of sea turtle—the leatherback—can dive over 1,000 m (3,000 ft)! The maximum depth ever recorded for a sea turtle dive was a leatherback that dove 1,200 m (3937 ft)". Below the answer text is a button labeled "RapidTrain (Major DML)". At the bottom of the interface, there are three buttons: "Submit Ranks", "Add Better Answer", and "Close".

4. How deep can sea turtles swim

JR Jay Rosen 02/28/24

5. What is the max depth a sea turtle can go

JR Jay Rosen 02/28/24

> Answer 1 ★★☆☆☆
Once hatched, the turtles find their way to the ocean via the downward slope of the beach and the reflections of the moon and stars on the water.

RapidTrain (Major DML)

Expiration date: 02/28/25 [Extend](#)

JR Jay Rosen

> Answer 2 ★★★★★
Most turtles can dive to depths of up to 290 m (960 ft). However, one species of sea turtle—the leatherback—can dive over 1,000 m (3,000 ft)! The maximum depth ever recorded for a sea turtle dive was a leatherback that dove 1,200 m (3937 ft)

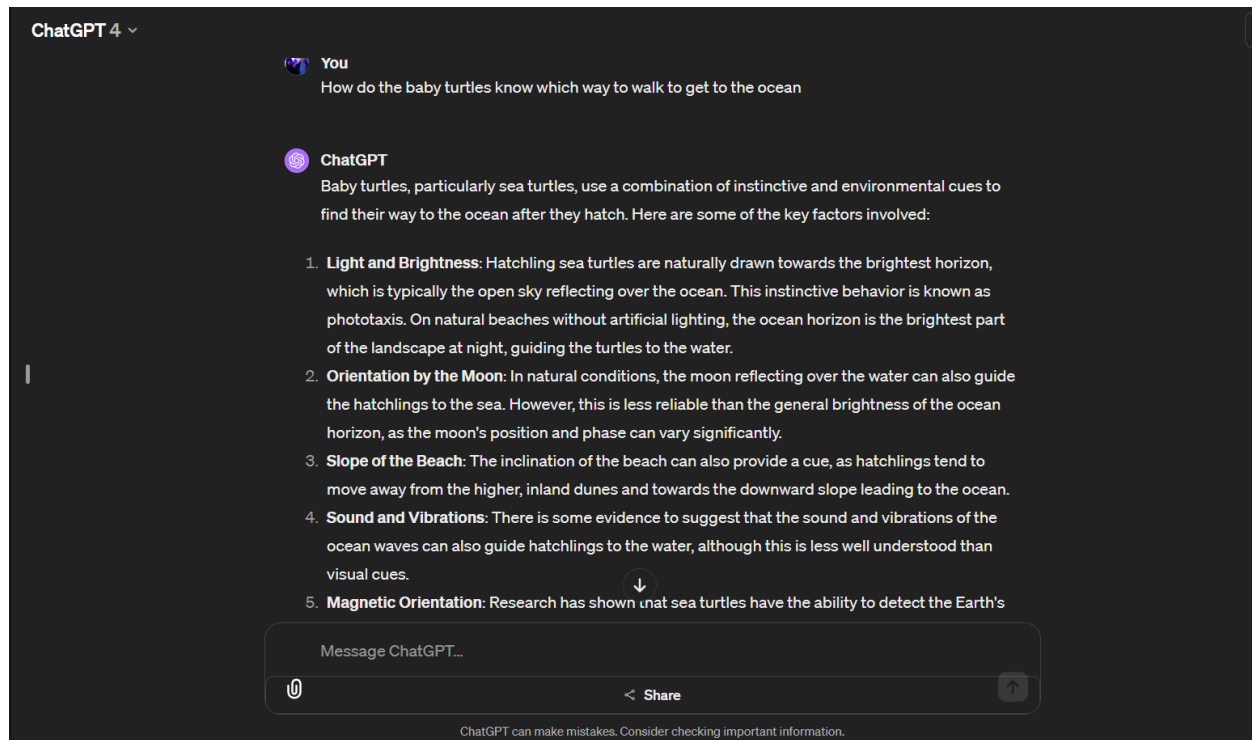
RapidTrain (Major DML)

Expiration date: 02/28/25 [Extend](#)

[Submit Ranks](#) [Add Better Answer](#) [Close](#)

For research methods, Google search engine was used to look up these questions. The top search results would come from reputable sources like National Ocean and Atmospheric

Administration (NOAA), National Geographic, or See Turtles Organization. The information on these websites was very similar since its factual, but the wording on these websites is slightly different, with NOAA having a more professional and scientific tone, while National Geographic and See Turtles Organization was simpler and easier to understand.



Additionally, newer tools such as ChatGPT and Google Gemini AI chatbots were utilized to answer these questions. It was interesting to compare how the 2 most popular AI chatbots would answer the questions, and I would even share the different responses with these 2 chatbots so they can understand how the other LLM is producing an answer. It was like the 2 chatbots were having a conversation with each other, and I served as a medium to exchange the information. The answers given by the 2 chatbots were very similar in wording, which suggests that ChatGPT and Gemini were trained on the same information, or similar data sources. It did seem kind of odd to use AI generated answers to teach another generative AI chatbot, but this was the quickest way to answer some of the questions given that Gemini is now integrated into Google Search. I do see that in the future, this method of generative AI training other generative AI models could lead to degrading quality of answers without human review, or diversity of knowledge. The only bias I was able to recognize was more mentions of Leatherback Sea turtles,

but this is possibly due to their larger size and longer lifespans compared to other species of sea turtles.

Gemini **Advanced** ▼



How can I watch a sea turtle lay eggs without bothering them



Absolutely! Here's a more relaxed version:

Want to watch a sea turtle lay eggs? It's awesome, but you've got to be careful not to freak them out. Here's the best way:

- **Find a turtle tour:** Lots of places with nesting turtles have guided tours. These folks know how to keep you and the turtle safe.
- **Ditch the lights:** No flashlights or phones – those bright lights bother them.
- **Be a statue:** Turtles get spooked easily, so stay super still and quiet while you watch.
- **Hands off!** It's tempting, but don't touch the turtle, nest, or eggs. Just watch from afar!

It's seriously a special thing to see, so let's make sure those awesome turtles can do their thing without any stress.

Enter a prompt here



Gemini may display inaccurate info, including about people, so double-check its responses. Your privacy & Gemini Apps

Cammy's tone of voice and vocabulary was exactly as it was trained based on the information from NOAA, National Geographic, ChatGPT, and Gemini. Cammy did not make up sentences it was not trained on, but just repeated answers verbatim it had already learned. CogBot has additional answer tooling to respond to questions in different manner such as telling jokes, giving directions, and technical tools such as displaying information about the trained model or mention the user's name. For this training, I just used the Add Answer feature to supply an answer to the question. Add answer uses a TinyMCE text editor, which is standard for blogs and website content creation. There is capability to supply a media file like image or video with the Answer, but I only added text-based responses. Some questions such as "What type of food do turtles eat", would potentially have multiple responses since different turtles eat different foods. For these questions, I answered with bullet point responses, so that each of the sea turtles could have their foods as part of the answer.

Classrooms / Sea Turtle Basics - STB1002 /

Sea Turtle Basics - STB1002

Spring 2024 ▾

Search questions...

All Faculty ▾ All Questions ▾ All

1. How do the baby turtles know which way to walk to get to the ocean	JR	Jay 02/
2. What do the sea turtles like to eat	JR	Jay 02/
3. How deep can sea turtles swim	JR	Jay 02/
4. What is the max depth a sea turtle can go	JR	Jay 02/
5. Do sea turtles live a long time	JR	Jay 02/

Terms of use

0 Questions Remaining

Cammy (in training) ✕

There may be AI-generated content in my responses ([see terms of use](#)).

View the [UF privacy statement](#).

[train](#)

What food do sea turtles eat?

[curate](#)

- **Green sea turtles:** Mostly eat plants like seaweed and seagrass.
- **Leatherback sea turtles:** Love to eat soft stuff like jellyfish.
- **Loggerhead sea turtles:** Like to crunch on hard-shelled creatures like crabs.
- **Hawksbill sea turtles:** Mostly eat sponges.
- **Olive ridley sea turtles:** Eat a mix of things like crabs, shrimp, and jellyfish.

[Search More](#)

[Ask a question...](#) →

When using the chatbot, there is option to Search More, which opens a relevant website in a new browser tab. Unfortunately, the Search More buttons kept going to CogBot website instead of a website about sea turtles. It seems this feature would be to see the cited data source but is currently not used like that in this training session. Another feature that did not seem to work was the microphone button, which I assumed was going to annotate my speech to text, but clicking the microphone button did not appear to do anything.

When a question is asked that has not been asked before, such as “How many types of sea turtles are there?” or “What countries do sea turtles habitat”, it would give an incorrect answer, but the UI does allow this new question to be added to the database with “Train” button, increasing the AI’s knowledge on the subject. After adding this question to the database, providing an answer, and ranking the suggested answers, the chatbot was able to answer the question shortly after.



Cammy (in training) ●



how many sea turtles are there

 curate

Sea turtles come in a range of sizes! The smallest sea turtles are around 2 feet long, while the biggest, the leatherback, can grow up to 6 feet and weigh over 1,000 pounds!

[Search More](#)

 train

how many sea turtles are there?

 curate

As of May 2023, scientists estimate that there are about 6.5 million sea turtles left in the wild. However, the exact number varies by species. For example, the



Ask a question...





Cammy (in training) ●



steps do not solve the issue, please try deleting the experiment and recreating it. If the problem persists, please email my CogBot Advisor at "advising-cammy-uf@cogability.com" for further assistance.

Search more

 train

how many eggs do turtles usually lay?

 curate

Sea turtles lay a lot of eggs! Typically, they lay around 110 eggs in a single nest, and they can create several nests in one season.

Search More



Ask a question...



References

1. OpenAI. "ChatGPT: Advanced AI Language Model for Conversational Agents."

<https://chat.openai.com/>

2. Google. "Google Gemini AI." <https://gemini.google.com/>

3. National Oceanic and Atmospheric Administration (NOAA).

<https://www.fisheries.noaa.gov/sea-turtles>

4. National Geographic

<https://www.nationalgeographic.com/animals/reptiles/facts/sea-turtles>

5. See Turtles Organization.

<https://www.seeturtles.org/baby-turtles>