

Introduction

The rise of artificial intelligence has driven remarkable progress across numerous fields, with chatbots becoming increasingly prevalent as a transformative tool in digital interactions. As Zemčík (2019) notes, these intelligent systems are being integrated more frequently into everyday operations and customer service, underscoring their potential to simplify communication and enhance user experience.

However, the widespread adoption and societal trust in chatbots are contingent on their design and capabilities, which can significantly impact workplace dynamics and broader social functions. The effectiveness of chatbots in gaining public trust hinges on their reliability and ease of use, highlighting the need for well-designed interfaces that foster confidence and usability (Wang, Lin, and Shao 2023).

In addressing environmental concerns, the UK's National Risk Register has recognized flooding as the most pressing environmental threat, given its frequency and severe consequences (Cabinet Office 2023). This ongoing issue is exacerbated by the UK's insufficient preparedness to handle such disasters (Bates et al. 2023; Perks et al. 2023), with current infrastructure and response strategies proving inadequate for the scale of flooding events now occurring.

The innovative use of chatbots in emergency management could greatly improve disaster response efforts by enhancing coordination and providing quick access to vital information (Peña-Cáceres and Correa-Calle 2024). This technological advancement could transform the way emergency services interact with the public and each other during crises, ensuring that accurate and timely information is efficiently disseminated. Moreover, the successful application of chatbots in other emergency situations demonstrates the potential of AI-driven solutions to address critical real-world challenges (Amiri and Karahanna 2022). These implementations show how chatbots can efficiently manage large volumes of queries and automate responses, freeing human responders to concentrate on more complex tasks requiring human judgement and expertise.

Need for Prototype

In the UK, public preparedness and awareness regarding tornado threats remain significantly low, highlighting the need for substantial improvements in education and readiness (Harrison 2020). Addressing this gap is crucial to ensure that communities are better informed and equipped to respond effectively to tornado risks and safety protocols.

The integration of chatbots in emergency preparedness efforts has proven to be highly beneficial, offering real-time, accurate information that is essential during tornado emergencies to minimize casualties and property damage (Rossi and Giacalone 2020). The growing reliance on chatbots as a key source of information during crises reflects an increasing confidence in their ability to provide timely and dependable support. As more individuals turn to these AI-driven tools for immediate access to critical information, the role of chatbots in enhancing public safety during tornadoes and other emergencies continues to expand (González Díaz and Martínez Estrella 2021).

Statement of the Problem

The core issue our chatbot aims to resolve is the inefficiency in distributing critical information and coordinating emergency responses during tornado events. Typically, the public struggles to access timely, actionable guidance on how to prepare for, respond to, and recover from tornadoes. This communication gap becomes even more pronounced during actual tornado situations, where emergency services and helplines are often overwhelmed, leading to significant delays in delivering essential, potentially life-saving information.

Aims and Objectives

Primary Aim: To create an AI-powered chatbot that provides real-time, authoritative guidance from the UK Met Office and relevant government agencies on tornado preparedness, response, and recovery, specifically designed for the UK environment. Objectives:

- To educate users on how to prepare for potential tornado events, using up-to-date guidelines from the UK Met Office.*

- *To deliver actionable steps during a tornado to ensure personal safety and protect property.*
- *To offer post-tornado recovery advice and resources, including information on insurance claims and accessing government assistance.*

Proposed Solution

The proposed solution involves developing a Tornado Response chatbot for the UK Met Office and relevant government agencies. This chatbot will address queries related to tornado preparedness, response, and recovery in the UK. A supervised learning model will be implemented, utilizing data from the Met Office and government websites to ensure that the chatbot delivers accurate and up-to-date tornado-related advice.

Prototype Design

Prototype Development and AI Algorithms

Step Description	Module
Used NLTK for processing and normalizing the language data.	