**TRIUMPH TIDINGS: A MENTAL HEALTH CHATBOT**

*Dissertation submitted in fulfilment of the requirements for the Degree of*

**BACHELOR OF TECHNOLOGY**

**IN**

**COMPUTER SCIENCE AND ENGINEERING WITH SPECIALIZATION IN**

**DATA SCIENCE AND MACHINE LEARNING**

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**DECLARATION STATEMENT**

I hereby declare that the research work reported in the dissertation/dissertation proposal entitled "TRIUMPH TIDINGS- A MENTAL HEALTH CHATBOT” in partial fulfilment of the requirement for the award of Degree for Bachelot of Technology in Computer Science and Engineering with Specialization in Data Science and Machine Learning at Lovely Professional University, Phagwara, Punjab is an authentic work carried out under supervision of my research supervisor Mr. Ved Prakash Chaubey. I have not submitted this work elsewhere for any degree or diploma.

I understand that the work presented herewith is in direct compliance with Lovely Professional University’s Policy on plagiarism, intellectual property rights, and highest standards of moral and ethical conduct. Therefore, to the best of my knowledge, the content of this dissertation represents authentic and honest research effort conducted, in its entirety, by me. I am fully responsible for the contents of my dissertation work.

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**SUPERVISOR’S CERTIFICATE**

This is to certify that the work reported in the B.Tech Dissertation/dissertation proposal entitled “**TRIUMPH TIDINGS- A MENTAL HEALTH CHATBOT”**, submitted by **PRANJAL SINHA** at **Lovely Professional University, Phagwara, India** is a bonafide record of his / her original work carried out under my supervision. This work has not been submitted elsewhere for any other degree.

Signature of Supervisor

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**Abstract**

In an era where the world is more interconnected than ever, the scourge of loneliness continues to plague individuals, especially students, who find themselves far from the comforting embrace of home. This project, titled "Triumph Tidings," endeavours to bridge the emotional dilemma faced by college students, particularly those living away from their families. Loneliness, if left unaddressed, can lead to severe consequences, ranging from mental health issues to drastic and impulsive decisions. Triumph Tidings emerges as a beacon of support, utilizing cutting-edge technology to provide solace and companionship to those in need.

Triumph Tidings is not just another chatbot; it is a compassionate companion crafted with care and empathy. Designed with the specific aim of combating the menace of loneliness prevalent among college students, Triumph Tidings acts as a virtual confidante, lending a patient ear to the struggles and triumphs of its users. Rooted in the principles of Natural Language Processing (NLP) and machine learning, this chatbot possesses the ability to understand the nuanced emotions embedded in human language, providing tailored responses that resonate with the user's state of mind.

As this project progresses, Triumph Tidings aims to become not just a chatbot but a transformative force, breaking the chains of isolation and fostering a sense of belonging among college students. This abstract encapsulates the essence of Triumph Tidings — a digital companion on a mission to eradicate loneliness, one conversation at a time.

**Introduction**

In the bustling corridors of higher education, where knowledge intertwines with ambition, a silent epidemic pervades the lives of countless students: loneliness. The college experience, often hailed as a time of intellectual growth and personal discovery, can be paradoxically isolating. For many, the transition from the familiarity of home to an unfamiliar campus in a different city or country can trigger profound feelings of solitude. This phenomenon is not limited by geographical boundaries; rather, it reverberates in dormitories, lecture halls, and communal spaces worldwide.

Loneliness, if left unaddressed, can metamorphose into a formidable adversary, gnawing at the core of mental well-being. It breeds feelings of alienation, anxiety, and melancholy, and in its darkest corners, it can pave the way for severe mental health issues. College life, with its academic pressures, social expectations, and newfound responsibilities, can magnify the impact of loneliness, rendering even the most resilient souls vulnerable.

**The Significance of the Problem:**

The importance of addressing this issue cannot be overstated. Loneliness not only affects the individual's mental health but also seeps into the fabric of the community, creating a collective sense of disconnection. This estrangement can hinder academic performance, social integration, and overall happiness, making it imperative to find innovative solutions that transcend the barriers of physical distance.

**The Motivation Behind Triumph Tidings:**

The genesis of Triumph Tidings lies in the shared experiences of countless students who have grappled with loneliness. As the project creator found themselves thousands of kilometers away from home, the pangs of isolation became palpable. Yet, amidst this struggle, a vision emerged — a vision of crafting a digital companion capable of mitigating the emotional turbulence faced by students worldwide.

**Triumph Tidings as a Supportive Companion:**

Triumph Tidings is not a mere technological endeavor; it is a manifestation of empathy and understanding. It is a response to the silent cries for connection echoing in the dormitories and common rooms. By harnessing the power of artificial intelligence, natural language processing, and machine learning, Triumph Tidings aspires to become more than just a chatbot. It is conceived as a virtual confidante, a steadfast companion that listens without judgment, speaks with compassion, and offers unwavering support.

**The Ripple Effect of Triumph Tidings:**

Beyond the individual impact, Triumph Tidings is poised to create a ripple effect. By alleviating the burden of loneliness, it nurtures a sense of belonging and camaraderie. It fosters resilience, empowers individuals to face challenges head-on, and provides a ray of hope in the face of despair. As students find solace in the digital realm, they are better equipped to navigate the complexities of college life, forging meaningful connections and embracing their academic journey with newfound vigour.

**RELATED WORK**

The field of mental health chatbots has witnessed significant advancements in recent years. Several notable projects have emerged, aiming to address the pressing issue of mental health and provide accessible support to individuals. One such example is **Woebot**, an AI-powered chatbot developed by psychologists and AI experts. **Woebot** utilizes cognitive-behavioral therapy techniques to engage users in interactive conversations, offering personalized emotional support and coping strategies.

**Wysa**, another prominent mental health chatbot, integrates AI with evidence-based therapeutic techniques. It focuses on emotional well-being, guiding users through mindfulness exercises, mood tracking, and relaxation techniques. **Replika**, an AI chatbot designed as a personal AI companion, provides users with a virtual friend for open conversations, thereby reducing feelings of loneliness and providing a non-judgmental space for self-expression.

By analyzing these existing solutions, **TriumphTidings** aims to draw inspiration and incorporate the best practices into its design. **TriumphTidings** distinguishes itself through its focus on not only providing empathetic responses but also encouraging users to take an active role in managing their mental health, fostering a sense of empowerment and resilience.

**PROBLEM STATEMENT**

The alarming rise in mental health issues, exacerbated by the challenges of modern life, necessitates innovative solutions. A significant problem lies in the lack of accessible and personalized mental health support. Traditional therapy methods face limitations due to high costs, stigma, and limited availability. Furthermore, many individuals, especially students and young adults, struggle with feelings of loneliness and anxiety, particularly in the context of the ongoing pandemic. TriumphTidings addresses this critical gap by offering an AI-powered mental health chatbot. This chatbot provides an empathetic, understanding presence, guiding users through their emotions, promoting self-awareness, and delivering coping mechanisms. The project's primary goal is to offer immediate, stigma-free, and effective mental health support to those in need, ensuring no one faces their battles alone.

**APPROACH**

TriumphTidings employs Natural Language Processing (NLP) and machine learning techniques to create an empathetic AI chatbot. Utilizing NLTK for language processing, the chatbot analyzes user inputs, identifying emotions and intents. The core of the system lies in a deep learning model constructed using a neural network with layers of dense, dropout, and softmax activation functions. This model is trained on a dataset containing categorized patterns and responses. The training enables the bot to understand and respond contextually. The graphical user interface (GUI) is built using Tkinter, enhancing user experience. TriumphTidings stands out for its personalized approach, tailoring responses to individual emotional states. Additionally, it incorporates features for recommending stress-buster exercises, fostering user engagement. The approach ensures a holistic, user-friendly, and effective mental health support system, promoting emotional well-being.

**Algorithms:**

TriumphTidings integrates two key algorithms: Natural Language Processing (NLP) for understanding user inputs and a deep learning algorithm for generating responses. NLP algorithms tokenize and lemmatize user queries, breaking them down into comprehensible patterns. These patterns are then fed into the deep learning algorithm, a Multilayer Perceptron (MLP) neural network. The MLP consists of layers for input, hidden, and output. Input nodes represent words in the vocabulary, while output nodes signify intents. Dropout layers prevent overfitting, ensuring the model generalizes well to unseen data. The softmax activation function at the output layer categorizes intents probabilistically, enabling the bot to choose the most appropriate response.

**Algorithm Explanation**

In the NLP algorithm, user inputs undergo tokenization and lemmatization, reducing words to their root forms. These processed tokens form a bag of words, representing the input pattern. The deep learning algorithm, an MLP neural network, takes this bag of words as input. The network consists of densely connected layers, trained on labeled data. During training, the model learns the mapping between input patterns and intents. Dropout layers prevent reliance on specific nodes, enhancing generalization. At inference, user inputs are converted into bag-of-words representations and fed into the trained MLP. The softmax activation function categorizes the input, enabling TriumphTidings to deliver contextually appropriate responses.

**Conclusion**

In conclusion, TriumphTidings represents a significant step toward addressing the mental health challenges faced by individuals, especially those battling loneliness and depression. Leveraging advanced technologies like NLP and deep learning, the chatbot engages users in natural conversations, offering empathetic support and helpful resources. By focusing on promoting proactive mental well-being, TriumphTidings aims to empower individuals to overcome their struggles actively. As an innovative tool, it not only provides companionship but also suggests coping mechanisms and stress relief techniques. Moving forward, continual enhancements and user feedback integration will refine TriumphTidings, ensuring it remains a reliable and compassionate companion on the journey to mental health recovery. This project underscores the transformative potential of technology in fostering emotional well-being and offers a beacon of hope for those in need.