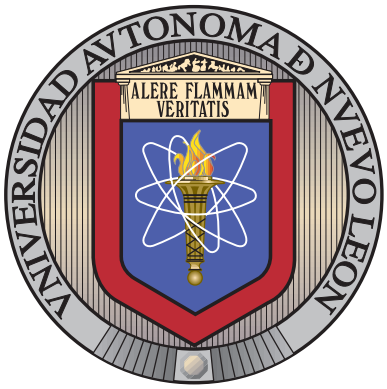
Universidad Autónoma de Nuevo León

Facultad de Ingeniería Mecánica y Eléctrica

Subdirección de Estudios de Posgrado



Sentiment Analysis through a chatbot

por

Alexander Espronceda Gómez

como requisito parcial para obtener el grado de

ingeniería en tecnología de software

Agosto 2021

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Los miembros del Comité de Tesis recomendamos que la Tesis «Sentiment Analysis through a chatbot», realizada por el alumno Alexander Espronceda Gómez, con número de matrícula 1742000, sea aceptada para su defensa como requisito parcial para obtener el grado de Ingeniería en Tecnología de Software.

El Comité de Tesis

Dra. Satu Elisa Schaeffer

Asesor

Nombre del revisor A

Revisor

Nombre del revisor B

Revisor

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Dr. ..

Subdirección de Estudios de Posgrado

San Nicolás de los Garza, Nuevo León, agosto 2021

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Agradecimientos

———(WORK IN PROGRESS)———

Agradezco profundamente al comité de tesis, a la Dra. Elisa Schaeffer, mi asesora de tesis, por el tiempo, apoyo y conocimiento otorgado durante el desarrollo de la tesis.

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Resumen

Alexander Espronceda Gómez.

Candidato para obtener el grado de Ingeniería en Tecnología de Software.

Universidad Autónoma de Nuevo León.

Facultad de Ingeniería Mecánica y Eléctrica.

Título del estudio: Sentiment Analysis through a chatbot.

Número de páginas: 5.

Objetivos y método de estudio: En esta tesis se propone generar un chatbot que interprete el texto introducido por un usuario y determinar su estado de ánimo, y reaccione de acuerdo con éste por medio de frases predeterminadas.

El método de estudio utilizado hará un análisis comprensivo de las redes neuronales, así como también de la comprensión suficiente de algo tan voluble y a veces impredecible como lo es la mente humana.

Contribuciones y conlusiones: El algoritmo de entrenamiento utiliza un dataset específico para intentar predecir qué está sintiendo una persona al momento de escribir alguna oración o frase.

Firma del asesor: _____

Dra. Satu Elisa Schaeffer

Chapter 1

Introduction

Human beings are social beings, this is widely known. To survive, we must band together and communicate with each other, bonding in the process. This is thanks to a neural process called **empathy**, which is defined as a three-part process that happens in our brains (Elliott *et al.*, 2011). That roughly happens like this:

- Emotional simulation centered in the limbic system, which makes us mirror the emotional elements we're watching.
- Processing the perspective in the prefrontal and temporal cortex.
- Assessing the course of action to take, either showing compassion or doing something else. This is allegedly based in the obitofrontal cortex, as well as several other parts of the brain.

This is clearly what we consider a normally human-only behavior, but there's been studies that indicate that apes, dogs and rodents have been observed to take action at the presence of distress signals, either from humans or other members of their own species (Preston y de Waal, 2002). If this is true, theoretically, we could teach a machine learning algorithm to process signals of distress and react accordingly.

1.1 Motivation

At first, I wanted to create an algorithm that could serve as a makeshift therapy chatbot that people could use when they were confused about their own feelings, but as time has passed, a lot of things have happened in my life regarding people with close-to-none empathy. This project could prove especially useful towards people who have trouble discerning when to console someone or having an idea of how other people or even themselves feel, such as the case of people with Asperger's Syndrome or other forms of high-functioning autism. To this end, I've decided to work on this project.

1.2 Hypothesis

Empathy consists in a pattern of neurochemical reactions triggered by different situations. Machine learning could learn to identify these patterns without them being processed biologically.

1.3 Objectives

In this section, I will establish the objectives I would like to touch upon in this paper.

1.3.1 General Objectives

The objective of this project is to determine how the user's feeling according to the words in the input. This will be achieved thanks to the technology present in machine learning algorithms and an extensive amount of datasets.

1.3.2 Specific Objectives

- Generating an algorithm capable of detecting key words related to the user's mood.
- Predicting successfully the user's mood according to their input.

1.4 Structure

—Work in progress—

Chapter 2

Sentiment Analysis

Sentiment Analysis (or Opinion Mining, as it is also known) as a tool for data analysis is arguably a recent happening. The term was coined in 2003 and has evolved ever since (Kumar y Teeja, 2012). This type of data analysis has a lot of potential usages that have yet to be implemented in the daily life.

2.1 Concept

At first, I wanted to create an algorithm that could serve as a makeshift therapy chatbot that people could use when they were confused about their own feelings, but as time has passed, a lot of things have happened in my life regarding people with close-to-none empathy. This project could prove especially useful towards people who have trouble discerning when to console someone or having an idea of how other people or even themselves feel, such as the case of people with Asperger's Syndrome or other forms of high-functioning autism. To this end, I've decided to work on this project.

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Resumen autobiográfico

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Tesis:
Sentiment Analysis through a chatbot

Aquí va tu historia. Recuerda que debe incluir: lugar y fecha de nacimiento, nombre de los padres, escuelas y universidades en las que se graduó después de la preparatoria, títulos o grados obtenidos (no incluir los estudios que se están concluyendo), experiencia profesional y organizaciones profesionales a las que pertenece (no incluir lista de publicaciones).