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**NEURO SYMBOLIC AI FOR ASSESSING
EMPLOYEE MENTAL HEALTH**

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MSc in Data Science and Artificial Intelligence

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degree
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DECLARATION

I declare that this is my own work and this Dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or Institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text. I retain the right to use this content in whole or part in future works (such as articles or books).

Signature:

Date: 24/06/2025

The supervisor should certify the Dissertation with the following declaration.

The above candidate has carried out research for the MSc in Data Science and Artificial Intelligence Dissertation under my supervision. I confirm that the declaration made above by the student is true and correct.

Name of Supervisor: Dr. A.L.A.T.D.Thanuja Ambegoda

Signature of the Supervisor:

Date:27/06/2025

DEDICATION

This thesis is dedicated to all individuals who strive to foster healthier workplaces by embracing mental well-being and inclusivity. It is also dedicated to researchers and innovators in the field of Artificial Intelligence, whose tireless efforts inspire transformative solutions for real-world challenges. Lastly, I dedicate this work to my family and friends, whose unwavering support and encouragement have been my greatest source of strength throughout this academic journey.

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I would also like to thank my family for their unwavering love, patience, and moral support. Without their constant encouragement and understanding, this journey would not have been possible.

Finally, I acknowledge the countless researchers and developers whose work inspired the development of innovative solutions in this project. Their contributions to the field of Artificial Intelligence and Natural Language Processing have provided a solid foundation for my research.

ABSTRACT

In the rapidly evolving corporate landscape, employee mental well-being has become integral to productivity and organizational success. This thesis introduces a groundbreaking Neuro-Symbolic Artificial Intelligence (NSAI) framework that integrates conversational data analysis to monitor and enhance workplace mental health. At its core, the Mentalisys Health Application leverages H2O Wave to provide user-friendly dashboards equipped with real-time sentiment analysis, stress, and depression detection capabilities. A novel Commonsense-Driven Symbolic ReAct-NLI (CSR-NLI) technique, based on OpenAI's language models, combines symbolic reasoning and natural language inference to uncover causality in workplace communication. Through interactive admin and user-specific dashboards, the system fosters proactive mental health interventions and personalized support, promoting a healthier workplace environment.

The study's primary contribution lies in advancing NSAI for robust causal understanding, going beyond conventional sentiment analysis. Results demonstrate significant potential in improving employee well-being and productivity via timely interventions and precise health risk assessments. This work underscores the transformative role of AI in addressing real-world mental health challenges, driving organizational growth, and enhancing employee satisfaction, while setting a new benchmark for AI-driven solutions in corporate mental health management.

Keywords: Neuro-Symbolic AI, Sentiment and Emotion Analysis, Commonsense Reasoning, Natural Language Inference, Workplace Mental Health, Employee Productivity Enhancement, Stress and Depression Detection, Corporate Communication Platforms, Mentalisys Health Application, Real-Time Analytics, Proactive Workplace Monitoring, Explainable AI Solutions

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