

# A Health Systems Approach to Analysing Physiological and Performance Demands in a First-time Boxing Bout

## Project Context & Research Problem

This study is based on a completed white-collar boxing bout (18<sup>th</sup> November 2025), for which structured performance and training data have already been collected. The project adopts a retrospective approach, integrating fight and training data to analyse physiological demand, fatigue, and performance efficiency in a high-intensity combat sports context.

### Research Question:

How do physiological workload, fatigue, and performance efficiency influence outcomes in a first-time boxing bout?

## Aim and Objectives

The aim of this study is to analyse the physiological and performance demands of a first-time boxing bout using a health systems perspective, integrating fight and training data to assess fatigue, efficiency, and recovery patterns.

### Data Collection:

- Video recording of the bout (livestream footage)
- Structured event tagging (punches thrown, landed, accuracy, shot distribution)
- Observational Notes recorded during and after the bout
- Training dataset tracking workload across sessions

The dataset consists of detailed round-by-round performance data from a 3-round boxing bout, including over 140 punches thrown and corresponding accuracy metrics. In addition, the training dataset includes multiple recorded sessions across different modalities (e.g. boxing, footwork, strength, and sparring), providing a structured record of workload leading up to the bout.

## Methodology

The study adopts a data-driven case study approach using quantitative performance data collected from a completed boxing bout.

### Analysis Methods:

- Descriptive statistics (e.g. totals, percentages, averages)
- Round-by-round performance analysis
- Comparative analysis (subject vs opponent)
- Trend analysis to assess fatigue and performance decline across rounds
- Data visualisation (e.g. Power BI / Python)

## Health Systems Interpretation

Direct physiological measures (e.g. heart rate) were not collected. Therefore, physiological demand is inferred using performance based indicators such as punch output, tempo and round by round decline.