# DATA FUSION FOR SLEEP STUDIES DATA

## Background

Currently during sleep studies in Theatre 3 during Mr Jonathan Collier and Dr Suveer Singh’s clinic, there are three major set of data collected for understanding, diagnosing, and treating sleep apnoea. The three important datasets are:

1. Anatomical data
2. Sleep physiology data
3. Anaesthetic data

The anatomical data shows the airway dynamics and location of sleep apnea event in the airway of the sleep apnoea patient during sleep. It is captured using a sleep endoscope. The sleep physiology data shows how the physiology dynamics of the sleep apnoea during sleep. The anaesthetic data shows how the induced sleep sedation during affects the physiology of the sleep apnoea patient during sleep.

## Problem

The challenges with current sleep endoscopy studies are:

1. The datasets are independently displayed
2. The datasets are independently stored in different storage system
3. The datasets are independently retrieved for treatment analysis
4. The datasets are not synchronised in time

## Aim

The aim of the chapter is to develop a viable prototype of a clinical system for data fusion of the anatomic and anaesthetic data during sleep apnoea studies.

## Objectives

The objectives of this chapter are to:

1. Design a system architecture for data fusion of data during sleep apnoea studies
2. Build the proposed system architecture proposed in Objective 1
3. Test the built system in objective 2 in laboratory setting
4. Test the built system in objective 2 in clinical setting
5. Report the result in objective 3 and 4
6. Discuss the system
7. Propose further systems architecture
8. Conclude on the proposed system.

## System Architecture

The aim of the section is to discuss the current system and design a system architecture for data fusion of data during sleep apnoea studies.

### Current System

### System Architecture

## Risk Analysis

## Result

## Conclusion