In this first chapter, I will explain why I decided to write this thesis and what the current solutions for human monitoring are like. Then, I will introduce my feasible solution for monitoring people using computer vision on a hybrid edge-server microservices architecture, which is beneficial for SMEs due to its cost-effectiveness and scalability.

0.1 Motivation

Small and Medium-sized Enterprises (SMEs)

0.2 Objectives and scope of Thesis

0.3 Tentative solution

0.4 Contributions

This thesis presents two main contributions:

1. An application is deployed on hybrid edge-server devices and uses a microservices architecture, allowing for easy system scaling (increasing the number of cameras). It includes:
   - A custom-trained, lightweight human detection model specifically designed for CPU-based, resource-constrained edge devices.
   - A vector database optimization algorithm for efficient identity retrieval. This uses a person's metadata (gender) to reduce the search space, improving retrieval speed and accuracy.
2. This thesis also provides an interactive web application. It lets users monitor the system, view live camera streams, and search for people using their metadata.

0.5 Organization of Thesis