MONASH
ENGINEERING

MONASH University

Faculty of Engineering

Summer Research Program 2024-2025

Project Title: Generating realistic images of surgical scenes

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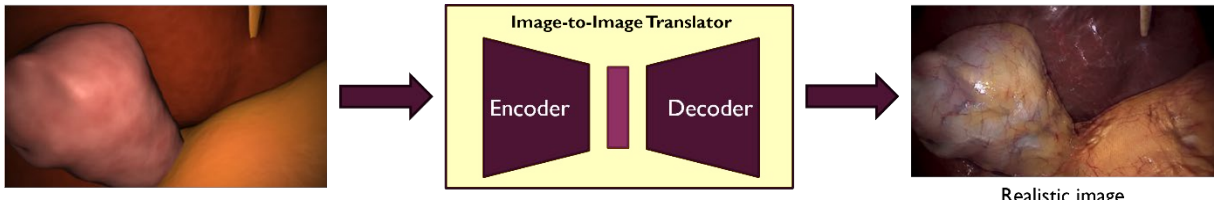
Objective

Autonomous surgery systems enable better surgical outcomes with fewer personnel. However, developing these systems requires data that is difficult to obtain in a real operation room. Computer simulated data can be generated with absolute accuracy, but the simulated scenes are not suitable for training a model to use in real-life.

AI driven image-to-image translation can convert simulated images into realistic surgical scenes. However, existing translators are imperfect e.g. the kidney texture is incorrectly applied to the liver. This project aims to create better models that enforce texture matching.



VR image +
Ground-truth motion data

Realistic image

Project Details

The stages of this project are:

1. Prepare suitable datasets
2. Develop a machine learning model based on existing models
3. Train and evaluate the model

Prerequisites

Familiar with coding (preferably Python)
Basic understanding of machine learning

Additional Information

Applicants may be required to attend an interview.