# Digital ICU : MA - Causal inference for predicting individual response to medicines

## General Info
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## Project Abstract
Digitalization in healthcare has led to the increasing use of digital medical systems in the Intensive Care Unit (ICU). They generate a large amount of data, such as the vital signs of patients, the blood gas analysis results, and the medication that a patient receives. This data can be analyzed using machine learning and data analytics techniques to help clinicians identify clinical deterioration in patients earlier and determine if a patient's treatment is working.

Given some prior medical knowledge from physicians cooperating with our project, we are interested in applying causal inference models to learn the correlation between medicines and the responses in physiological signals for individual patients. Possible applications / validation ideas for the model include:
- predicting patients' response in their physiological signals after taking certain medicine
- individual treatment planning
- …

## Tasks Description
- Literature reviews on causal models and the idea of individual treatment planning
- Clean and preprocess data from public dataset to fit with your task scope
- Implement causal inference model for continuous variables
- Visualize the causal graph and validate with physicians

## Technical Prerequisites
- Good knowledge in probability theory and machine learning
- Python, experiences with libraries like pandas, scikit-learn, pytorch, matplotlib, etc.