# Utility AI tool for Unity

Creating AIs in computer games or simulations has always been a challenging task, and coding complex behaviours can be very time-consuming. Hence, the idea of Utility Designer, an intuitive tool designed for this thesis to aid in with the creation of AIs in Unity. It combines the principles of utility AI with widely used behaviour trees to allow for the formation of intelligent and dynamic Non-Player Characters (NPCs).

## Goal

The main goal of Utility Designer is to provide Unity developers with a powerful and generic tool for creating AI behaviours using utility AI. The concept of utility AI is not very well known, and this thesis aims to make it more accessible to everyone. When fully completed, Utility Designer will be published to the Unity Asset Store.

## Results

Two example scenes were created to demonstrate and evaluate Utility Designer in action. The results show that this tool excels at quickly creating intelligent and lifelike behaviours, but it may not be as suitable for all situations. The ideal use case is where NPCs need to make dynamic decisions based on the current situation and cannot simply follow fixed rules. A notable advantage is its embedded behaviour tree system. This allows it to be used as a traditional behaviour tree, bypassing the utility AI part if desired, thus increasing its versatility.

## Functionality

The Utility Designer tool has two main tabs. The Evaluation tab uses utility AI to decide which state is best for the NPC in the current situation. each state is being scored based on various factors, such as the environment or needs of the character. In the Execution tab, each state is assigned a Behaviour Tree, which is used to define the behaviour of each state. The state that scored highest during evaluation will have its behaviour tree executed. This will cause the NPC to interact with the environment.

David Kaeser
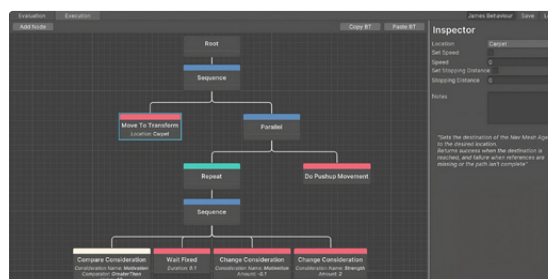


Execution tab showing a behaviour tree
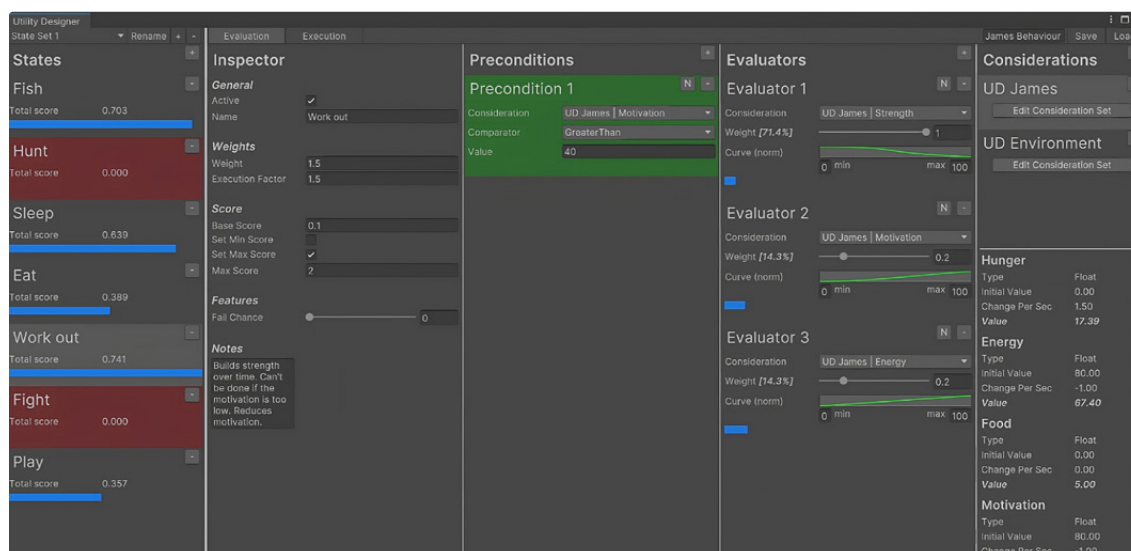


Run-time display of the evaluation tab of Utility Designer