

**Tutorial 13 Tactical AI****Introduction**

In this tutorial, you will gain better understanding about tactical AI. Refer to Lecture 10 handout for completing this tutorial.

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other public websites**

**Note**

Denote your 8-digit student ID number as  $d_1d_2d_3d_4d_5d_6d_7d_8$ . Use this notation to solve the tutorial problems.

**Task 1. Convolution Filter**

We have a  $2 \times 2$  location map defined as follows:

$$L = \begin{bmatrix} d_5 & d_6 \\ d_7 & d_8 \end{bmatrix}$$

We make use of the following  $3 \times 3$  convolution filter to obtain the influence map:

$$M = \frac{1}{16} \begin{bmatrix} 1 & 2 & 1 \\ 2 & 4 & 2 \\ 1 & 2 & 1 \end{bmatrix}$$

- (a) Calculate the influence map  $L1$  by modifying the map, i.e., by padding the location map with 0s. Denote  $L1$  as

$$L1 = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$$

Represent each value of  $a, b, c, d$  as a fraction in its simplest form, i.e., in the form of  $\frac{p}{q}$  where  $p$  and  $q$  are integers and do not have common factors larger than 1.

- (b) Calculate the influence map  $L2$  by modifying the filter matrix, i.e., by setting all filter matrix elements that correspond to locations outside the map to 0 while maintaining the sum of resulting filter matrix elements to 1. Denote  $L2$  as

$$L2 = \begin{bmatrix} e & f \\ g & h \end{bmatrix}$$

Represent each value of  $e, f, g, h$  as a fraction in its simplest form, i.e., in the form of  $\frac{p}{q}$  where  $p$  and  $q$  are integers and do not have common factors larger than 1.

**There is no need to complete any Canvas Quiz for this tutorial**