

Homework from Fuzzy Logic.

Exercises from conversions of representations of continuous fuzzy sets.

Exercise 2.1 *Fuzzy set A has the following vertical representation:*

$$\mu_A(x) = \begin{cases} 1, & x \in [1, 2], \\ \frac{x+2}{3}, & x \in [-2, 1], \\ \frac{4-x}{2}, & x \in (2, 4], \\ 0, & \text{otherwise.} \end{cases}$$

Find the horizontal representation of this fuzzy set.

Exercise 2.2 *Fuzzy set B is given by its collection of cuts:*

$$\mathcal{R}_B(\alpha) = \begin{cases} \mathbb{R}, & \alpha = 0, \\ [3\alpha, 17 - 2\alpha], & \alpha \in (0, 1]. \end{cases}$$

Find its vertical representation.

Exercise 2.3 *Fuzzy set C is given by its collection of cuts:*

$$\mathcal{R}_C(\alpha) = \begin{cases} \mathbb{R}, & \alpha = 0, \\ (3\alpha, 17 - 2\alpha], & \alpha \in (0, 1]. \end{cases}$$

Find its vertical representation.

Exercise 2.4 *Fuzzy set D is given by its collection of cuts:*

$$\mathcal{R}_D(\alpha) = \begin{cases} \mathbb{R}, & \alpha = 0, \\ [3\alpha, 17 - 2\alpha], & \alpha \in (0, 1), \\ \{4\}, & \alpha = 1. \end{cases}$$

Find its vertical representation.