

# Sea-ice Flow Simplified

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## Abstract

## 1 Introduction

This is an Introduction

## 2 Method

### 2.1 Mathematics

The speed of the piece can be modeled as

$$U = 0.5 + 0.3\sin(2\pi x)$$

where  $x$  is the position of the piece, and we have data  $x_1(0) = 0.3$ ,  $x_2(0) = 0.7$ , and  $v_1(0) = v_2(0) = 0$ . We want to calculate  $x_k(t_j)$  and  $v_k(t_j)$  for  $k = 1, 2$  and  $j = 1 \dots 10000$ , where  $\delta t = 10^{-3}$  and  $t_j = \delta t j$ , such that

$$\begin{cases} \frac{\partial x_k}{\partial t} = v_k \\ \frac{\partial v_k}{\partial t} = (u - v_k)|u - v_k| \end{cases}$$

and

$$\frac{x_k(t_{j+1}) - x_k(t_j)}{\delta t} = v_k(t_j)$$

### 2.2 Neural Network

The neural network is a feed-forward network with 2 hidden layers, each with 10 neurons as shown in Figure 1.

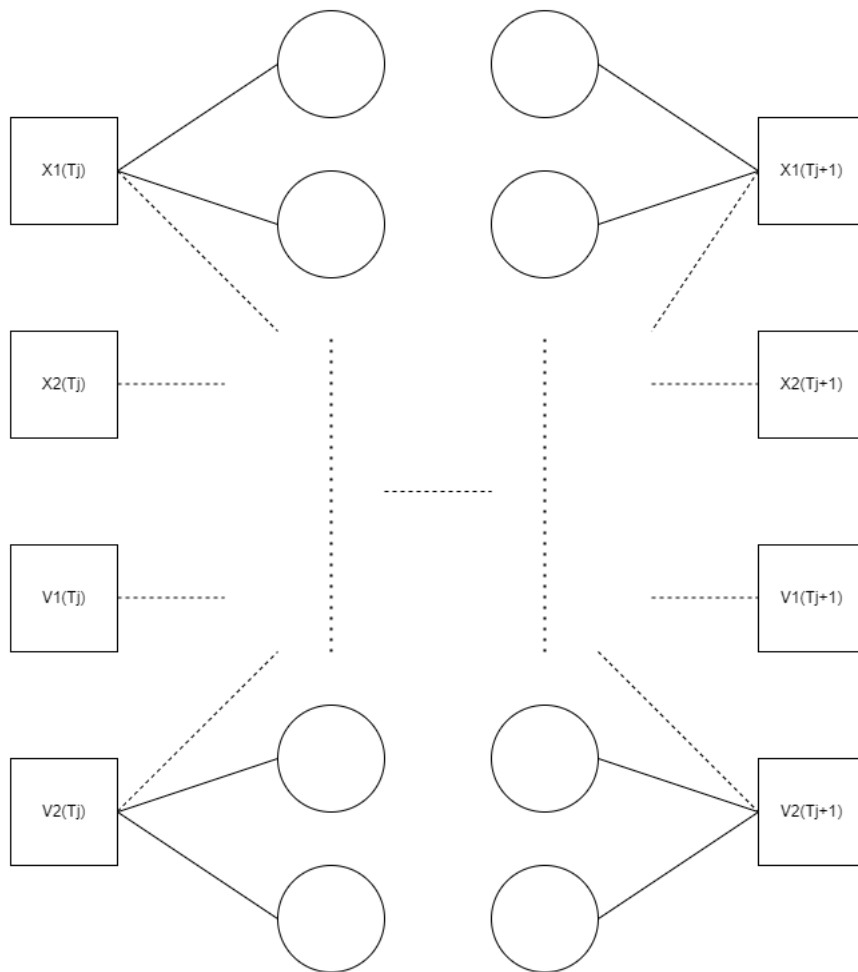


Figure 1: Neural Network structure

### 3 Discussion