### BOSTON UNIVERSITY

# Photonics chips for machine learning

Hongye Shi, Bochun Lvy, SuYang

### Introduction

### **Motivation:**

Photonics chips are a new topic, we want to take time to learn something new.

### The design goal:

Design simulator to show the improvement of speed by using Photonics chips

The basic design is using python to write codes to do some tests. We also want to build some physical devices.

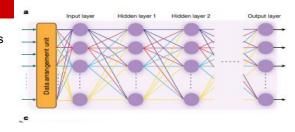
### Theory: Image Recognition

We hope to use optical principles and linear computing to further understand the visual nervous system, and through the help of photonic chips, to strengthen machine learning.

# System Flowchart Input Image Processing Convolution System Flowchart Teature recognition Yes Output Image

### Physical Equipment

We envisioned trying the physical equipment to complete the test, but lacked knowledge and practice.





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## **Next Steps:**

Improve the simulator part, hoping to get the improvement rate of image recognition speed.

Try to understand and assemble a physical chip

### Design and Results

- The image recognition
- Ring Resonator
- Convolution loop

The test programme shows the improvement on Simulator, but the final result is not ideal.

