Project Proposal

Artificial Intelligence-E

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## Group Members

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# Fall Detection

## Introduction

This project is concerned with detecting a person/thing falling to the ground in a video. We will be looking at relative positions of the subject, in successive frames extracted from a 3-second video, with respect to the ground. For example, a person walking will be at the same distance from the ground throughout all frames and should not be classified as “falling”. On the other hand, a person/thing falling from a height and hitting the ground will be detected as a fall. In practical applications, given a video of any length, we can detect if something in the video had fallen.

## Recurrent Neural Networks

We will be using neural networks to accomplish the learning task. In particular we will be using Recurrent Neural Networks, which is a class of ANNs that uses a directed graph to represent the connections between its units. The internal states (memory) of the network will be used to store and process sequences of input images. The “memory” of the RNNs will be implemented using LSTM (Long-Term Short Memory). LSTM is suited for this application because each cell can remember values over arbitrary, long intervals of time.

The training set for this application will consist of short videos on the order of thousands (hundreds if performance hindrance occurs). With one example, we will be extracting every frame in the video as an image and feed it to the RNN.

## Tools

Implementation will be in Python 3.5+. A video editor to extract frames as images will also be required.