SOFTWARE REQUIREMENTS SPECIFICATION

for

Deep Learning on Embedded Platform

Version 1.0

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CS 461

November 3, 2016

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1 Introduction

1.1 Purpose

The goal of this document is to create a clear requirements documentation that identifies the necessary parts to accomplish this project. The main requirements are to run a deep learning application on the Jetson TX1 development kit and to have docume ntation clear enough to recreate our project. The end result of this project will be an AI capable of playing the game Galaga, and the project itself will be u sed by Nvidia to create a lesson for their deep learning institute. Since the lesson plan will not be developed by us, this document only covers the project requirements and not requi rements for the lesson.

1.2 Scope

The project name will be AI Gaming and the solution of our project will need to be able to beat the first level of the game at least 90% of the time. Ideally the system should be able to make it past level five approximately 50% of the time. The ability of the system to make it farther than that on average, or to increase the percent chance on it making it to certain points, will be considered a stretch goal.

1.3 Definitions, acronyms, and abbreviations

JETSON TX1 Developer Kit: Tiny computer which has a full-featured development platform for visual computing.
AI: A branch of computer science dealing with the simulation of intelligent behavior in computers.

1.4 References

N. C. L. Information, Deep learning, NVIDIA Developer, 2016. [Online]. Available: https://developer.nvidia.com/deep-learning. Accessed: Oct. 18, 2016.
NVIDIA, 2016. [Online]. Available: http://www.nvidia.com/object/jetson-tx1-dev-kit.html. Accessed: Nov. 2, 2016.
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2 Overall Description

2.1 Product perspective

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2.2 Product Functions

The project goal is to teach a neural net to play a video game. The neural net will take video input and use it to learn how to play the game Galaga. A camera or screen capture device must be used to retrieve game state input. The neural net must be trained and allowed to create its own code to accomplish the task. The neural network should define for itself how to respond to in-game stimuli and react accordingly, as per the training it has received. We may code interactions between the net and the game to allow it to play the game. We may not hard code its responses to in-game stimuli, as these responses must be trained into the neural net. The final project must be able to run inference on the Jetson TX1 developer platform.

2.3 User characteristics

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2.4 Constraints

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2.5 Assumptions and dependencies

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3 Chart

3.1 Timeline