Australian National University

# INDEPENDENT STUDY CONTRACT PROJECTS

***Note: Enrolment is subject to approval by the course convenor***

## SECTION A (Students and Supervisors)

UniID: u6325688

SURNAME: XU FIRST NAMES: YANGYANG

PROJECT SUPERVISOR (*may be external*):

FORMAL SUPERVISOR (*if different, must be an RSSCS academic*): Dr. Penny Kyburz

COURSE CODE, TITLE AND UNITS: COMP8755, Individual Computing Project, 12 units

**COMMENCING SEMESTER** ☑ S1 ☐ S2 YEAR: 2019 _ Two-semester project (12u courses only): ☑

**PROJECT TITLE:**

Teach AI to play Atari IceHockey game using gameplay videos

**LEARNING OBJECTIVES:**

(1) Apply knowledge and implementation skills in to use gameplay video recordings to teach AI players to play an IceHockey game.
(2) Deepen knowledge of advanced computing principles through training and testing an IceHockey game AI learn specific technical skills required to use OpenAI to implement and test the AI.
(3) Learn relevant project-related skills, including project management and oral and written communication, and apply these to project work.

**PROJECT DESCRIPTION:**

This project aims to use gameplay video recordings to teach AI players to play the IceHockey video game. The project will involve capturing gameplay video recordings using OpenAI for the old Atari video game, IceHockey. Methods used to train the bots will draw on reinforcement learning and imitation learning. The student will use OpenAI Gym as the learning environment and implement the project using Python.

The tasks involved in this project will be:

【1】Researching existing applications of training video game AI using gameplay videos.

【2】Capturing gameplay videos of IceHockey using OpenAI.

【3】Analysing gameplay videos to extract features using OpenCV (or alternative approaches).

【4】Train bot using an appropriate learning method and extracted features.

【5】Test the bot's ability to play IceHockey.

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**ASSESSMENT (as per the project course's rules web page, with any differences noted below).**

| **Assessed project components:** | **% of mark** | **Due date** | **Evaluated by:** |
|---|---|---|---|
| Report: style: Research Report<br>(e.g. research report, software description...,) | (min 45, def 60) | | (examiner ) |
| Artefact: kind: Software<br>(e.g. software, user interface, robot...,) | (max 45, def 30) | | (supervisor)<br>Dr. Penny Kyburz |
| Presentation : | (10) | | (course convenor)<br>Professor Weifa Liang |

**MEETING DATES (IF KNOWN):**

**STUDENT DECLARATION: I agree to fulfil the above defined contract:**

…….. 26/02/2019 ……..

Signature Date

## SECTION B (Supervisor):

I am willing to supervise and support this project. I have checked the student's academic record and believe this student can complete the project. I nominate the following examiner, and have obtained their consent to review the report (via signature below or attached email)

……..……..…….. ……..

Signature Date

**Examiner:**

Name: …… Signature ……

(Nominated examiners may be subject to change on request by the supervisor or course convenor)

**REQUIRED DEPARTMENT RESOURCES:**

## SECTION C (Course convenor approval)

…….. ……..

Signature Date