Australian National University

INDEPENDENT STUDY CONTRACT

Note: Enrolment is subject to approval by the Honours/projects co-ordinator

SECTION A (Students and Supervisors)

UniID: u6527600

FAMILY NAME: Ao PERSONAL NAME(S): Mingzhen

PROJECT SUPERVISOR (*may be external*): Pascal Bercher and Florian Geisser

COURSE SUPERVISOR (*a RSCS academic*):

COURSE CODE, TITLE AND UNIT: COMP8755, Individual Computing Project, 12 pt

SEMESTER ☐ S1 YEAR: _____ ☒ S2 YEAR: 2020

PROJECT TITLE: Solving Puzzle Games Using Constraint Solving Techniques

LEARNING OBJECTIVES:

After successfully completing the project the student should be able to:
- model combinatorial puzzle games in a "correct" way (meaning that the student's model adequately represents the actual puzzle game in the real world, i.e., that the model's set of solutions corresponds perfectly to the set of solutions of the actual puzzle) using different constraint description languages, such as CSPs, LPs/ILPs/MIPs, or SAT.
- formalize those models using standard descriptions languages for the respective established standard solvers for the respective formalisms.
- conduct an empirical evaluation thereby comparing the different types of models with each other

PROJECT DESCRIPTION:

In this project the student has to model a range of combinatorial puzzle games, such as Cube Puzzler - Go and IQ Twist by Smart Games. Further puzzles to model and solve will be decided on together by the supervisors and the student. Each puzzle will have to be modeled using different constraint languagues, such as CSPs, LPs/ILPs/MIPs, or SAT. The student has to research appropriate solvers that are able to solve these problems. The student has to conduct an empirical evaluation that compares the different models/solvers and different options of the respective solvers or models and their impact on runtime (e.g., CSPs allow different kinds of constraint propagation; and each problem can be modeled in different ways, even with the same constraint language).

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

☐ Honours (24 credit)	(fixed)	☒ Projects (~~6~~ (12) credit)	…. / (fixed)
Assessed project components:	**% of mark**	**Assessed project components:**	**% of mark**
Thesis	(85%)	**Thesis** (reviewer mark)	45 45-60%
Presentation	(10%)	**Artefact** (supervisor project mark)	45 30-45%
Critical Feedback	(5%)	**Presentation**	(10%)

MEETING DATES (IF KNOWN):

Weekly

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

....

Signature Date

SECTION B (Supervisor):

This project has two supervisors! (see above)

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.

Pascal Berder: ..... July 24, 2020

Signature Date

Reviewer: Florian Gaisser: 07/29/2020

Name: ..... Signature: .....

Reviewer 2: (for Honours only)

Name: ..... Signature: .....

REQUIRED DEPARTMENT RESOURCES:

SECTION C (Honours / Projects coordinator approval)

…….. ……

Signature Date