STATEMENT OF WORK

SOFTWARS – LVC Integration

Project Group:
Bridget Free, Do Tran, Andrew Russell and Tate Waters

Project Dates:
Monday 02 March 20 – Monday 08 June 20 (Semester 1)

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16 March 2020

INTRODUCTION

SOFTWARS' aim is to foster a greater understanding of systems and simulation by producing the highest quality of research and code.

CONTACT DETAILS AND RESPONSIBILITES

Contact	Email
Project Manager and Documentation: Bridget Free	bridget.e.free@gmail.com
External Liaison and Client Manager: Tate Waters	tatememate@gmail.com
Assistant Technical Developer and Testing: Andrew Russell	andrew.russell9899@gmail.com
Lead Technical Developer: Do Tran	tranngocdo6111998@gmail.com
Client: Dr Sura De Silva	sura@terraschwartz.com
Supervisors: Dr Erandi Lakshika Hene Kankanamge Dr Daryl Essam	e.henekankanamge@adfa.edu.au d.essam@adfa.edu.au

BACKGROUND INFORMATION

There are various established frameworks including HLA, DIS and VBS. We aim to create "pattern of life" behaviour that is injected into one or more connected, distinct simulators via middleware (DIS). This will then display a high-fidelity behaviour model to populate simulators and improve "real word" simulation.

CURRENT ENVIRONMENT

- Current technology available includes open-source implementations of DIS – KDIS, OpenDis and various behaviour algorithms (flock, crowd etc.). Other programs utilized will include VBS3 as the

main simulator and Unity as the source of behaviour injection.

- Current constraints for this project include access to labs being often limited to working hours.
- Users will be able to play inside a multiplayer connected VBS scenario that will be continually updated in real-time with injected pattern of life behaviour from Unity.

SCOPE OF WORK

The IT Project Group has chosen to take on this project in Semester 1, 2020 and will be working with a client – Dr Sura De Silva from Terra Schwartz. The group will take ownership and management of the planning, design, development/build and testing of the project.

SOFTWARS aims to show how a virtual environment and a specialist system can be linked to improve simulation, with particular focus on aiding LVC training exercises for military use. This will be achieved through the development of a game environment using Unity and a unidirectional DIS gateway for the developed game environment that can receive entity states from the network. The broadcast data will then be interpreted by the visualization platform.

DELIVERABLES

- Created behaviour models that generate different levels of behaviors to inject into the simulation platform. These models should be able to accommodate other entities in the simulation environments and react accordingly.

- Configured middleware that can encode and inject DIS traffic and use any information in captured entity state PDUs to update the visualization environment.

MILESTONES

The following table provides an initial schedule for the project:

Milestone	Estimated Delivery Date
Client meeting notes	Thu 5 March (Week 2)
Group charter	Fri 13 March (Week 3)
Project review with course staff	Mon 23 March (Week 5)
Finalized functional specification	Fri 27 March (Week 5)
Second project review with course staff	Mon 11 May (Week 10)
Presentation of project	Mon 8 June (Week 14 – time TBC)
Project 1 Due	Mon 8 June (Week 14)

PERIOD OF PERFORMANCE

The period of performance for this project lasts the entirety of Semester One - starting on Monday 02 March 2020 and ending on Monday 08 June 2020.
There will be a minor break period during the middle (leave period) from Saturday 04 April 20 until Sunday 12 April 20 where minimal work will be accomplished.

PLACE OF PERFORMANCE

The project place of performance will be the ADFA UNSW Canberra precinct with multiple client meetings held off campus at UNSW Canberra Launch – Terra Schwartz offices.

APPLICABLE STANDARDS

The IEEE Standard for Distributed Interactive Simulation--Application Protocols will be applicable for this project. It defines data messages, known as Protocol Data Units (PDUs), that are exchanged on a network among simulation applications and their interactions.

SPECIFIC REQUIREMENTS

1. Phase One – Planning
    a. Team roles
    b. Formalized project requirements
    c. Client meetings
    d. Project plan, development methodology and software choice
    e. Client contract
2. Phase Two – Develop/Build
    a. Decide on behavioral algorithm
    b. Code behaviour in Unity
    c. Concurrent meetings with client and course supervisors
    d. Middleware configuration using open source DIS
    e. Broadcast pattern of life behaviours into DIS capable virtual platform
3. Phase Three – Testing
    a. Create test cases and testing plan and resolve any issues
    b. De-bug with a focus on accessibility and usability
4. Phase Four – Project Delivery
    a. Project artefacts
    b. Customer acceptance report
    c. Course advisor meeting
    d. Presentation

RESOURCE REQUIREMENTS

HUMAN RESOURCES

Title	Required Knowledge/Skills
Group Members	C# Skills (Unity)
	Linear Algebra (Coordinate transformation, Rotation matrices, Quaternion) – behaviour algorithms

OTHER RESOURCES

Resource Description
VBS
Unity (game engine)
OpenDIS (open source DIS gateway)

CLIENT AND STAKEHOLDER RESPONSIBILITIES

The stakeholder and client for this project is Dr Sura De Silva. The client will be responsible for:

a. Outlining and agreeing to the outcomes and deliverables of the project as per this Statement of Work.
b. Responding to emails from the groups' external liaison within 2 business days where possible.
c. Clarifying and providing guidance on various aspects of the project (e.g. simulation standards) where required.

Dr Erandi Lakshika Hene Kankanamge and Dr Daryl Essam are the course supervisors and it will be their responsibility to:

a. Assist in the obtaining of any required programs (e.g. lab access for VBS)
b. Assist with the day-to-day questions about the project
c. Provide advice and guidance on team interactions and give feedback on their observations to assist with any improvements that would result in a better outcome for both the team, project and client.

PROJECT RISKS

High-level perspective risks:

ID	Risk Description	Likelihood of risk occurring	Impact if risk occurs	Severity	Mitigating action
1	Project purpose and deliverable requirements are not well defined	Medium	High	High	Ensure project is accurately defined in charter, statement of work and any other relevant artefacts. Any changes or clarifications to deliverables notified to the entire team as soon as possible.
2	Estimating and/or scheduling errors	Medium	High	High	Track schedules utilizing Jira software and ensure all agenda items are covered when meeting (due to time constraints). Flag any errors as early as possible and notify client when required.
3	Lack of communication, causing lack of clarity and confusion	Medium	Medium	Medium	Use most appropriate channel of communication for audience. Correct misunderstandings immediately. Notify relevant stakeholders immediately for clarification.
4	Acts of God for example, extreme weather, leads to loss of resources, materials, premises etc.	Medium	High	High	Due to the increasing nature of COVID 19, talk to supervisors about gaining remote access to VBS through labs or another simulation possiblity. Inform client immediately on the likelihood of project timeline extension.

ASSUMPTIONS

Resources – all required resources (VBS) will be made available through UNSW Canberra.
Budget and Finances – any required funding will be approved by UNSW supervisors, but the project will be completed at lowest cost possible.
Methodology - Kanban project management will be utilized through Jira software and Github.

COMPLETION CRITERIA

Presentable deliverable in Unity that accurately injects Boid-like NPC traffic into any number of simulators connected to the network (via DIS gateway).

MEETINGS AND REPORTING

An understanding of potential future meetings with the client is as follows:

a. Group meetings/video call at least once a week (Flexible schedule of 1230 every Thursday)
b. Attend the final project presentation

Reporting:

- Email Client for all important communications or add to weekly meeting agenda. - Meeting agenda confirmed NLT 1200 Wednesday and confirmed by all members NLT COB Wednesday (uploaded under Jira task)
- All email content is external liaison's responsibility with input from all members on content.
- All external comms uploaded under relevant task.
- Meeting note-taking shared – project manager to collate and confirm details.

- Any required artefacts to be published on git and Jira (under relevant task/tab) with all members to approve before submission/final upload.

CHANGE CONTROL PROCEDURE

The above outlined deliverable and milestone requirements will be the roadmap for SOFTWARS to deliver the current project on LVC Integration. This document will be agreed to by all parties and published by SOFTWARS. Changes to any planning or deliverable process will be accomplished in accordance with the Change Control Procedures as described below.

Change control for additional services or scope to be delivered by the team will be updated following the below procedure:

1. The updated request will be reviewed by the project manager (Bridget Free) in order to minimize the risk of exceeding time estimates.
2. The team will then be briefed on the possible changes and relative impact on current workload.
3. A vote will be taken on the change control with the majority allowing the change through.
4. The current statement of work will then be updated to reflect any changes and stakeholders notified.

INTELLECTUAL PROPERTY AND DEFENCE SECURITY

This project will be developed with the aim of being utilized a publicly available developmental software. Any intellectual property created, made, or originated by a team member shall be the sole and exclusive property of the author, except as he or she may voluntarily choose to transfer such property, in full, or in part. All ownership must be correctly sited as per Commonwealth *Copyright Act* 1968 (Copyright Act).

The security classification of work to be performed under the Deed and this Official Order will be at the UNCLASSIFIED level. Should a higher level of classification be required, the requirements will be discussed with supervisors further and any action in compliance with the requirements and procedures of Part 2:20 of the DSM, as amended from time to time.

POINTS OF CONTACT

The main POC for this project is Bridget Free (Project Manager). For all critical information updates please call on 0468 309 215 otherwise email bridget.e.free@gmail.com.

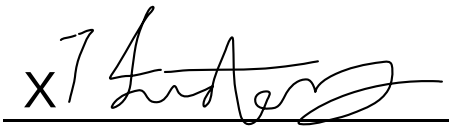
ACCEPTANCE

Date: _____

As a signatory to this document, I will abide by the above standards.

X 

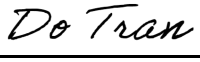
Bridget Free
Project Manager

X 

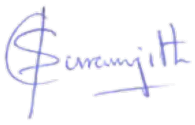
Tate Waters
External Liaison and Client Manager

X 

Andrew Russell
Assistant Technical Developer and Testing

X 

Do Tran
Lead Technical Developer

X 

Dr Sura De Silva
Client - Terra Schwartz