# A Network Extension for the Gamemaker HTML5 Export Module

Teun Kokke

Undergraduate Dissertation Software Engineering School of Informatics University of Edinburgh 2016

#### **Abstract**

summarising the report

#### Acknowledgements

Acknowledgements go here.

# **Table of Contents**

1	Prea	mble	5
	1.1	Backgrou	nd
		1.1.1 H	TML5
		1.1.2 N	odeJS
		1.1.3 G	ameMaker
		1.1.4 N	etworks in Applications
		1.1.5 T	CP and UDP
		1.1.6 In	ter-application Communication
	1.2	Related W	Vork
			nity
			nreal Engine 4
			ryEngine
		1.2.4 H	avok Vision Engine
			roject Anarchy
			hiVa
			pp Game Kit
			ameSalad
2		rature Rev	
	2.1		er Networking in Modern Game Engines
	2.2	Fairnesss	and Playability in Online Multiplayer Games
	2.3		
2	ъ	1	4.4
3		elopment	11
	3.1	_	
			rior Considerations
			erver and Client
	3.2	_	itation
			erver
			lient
			he Extension
	3.3		ons Developed with the Extension
			enchmark Application
			eal Game Application
		3.3.3 D	eveloper Template

4	Netv	twork Extension Evaluation						13
	4.1	Setup						13
		4.1.1 Controlled Network Experiments						13
		4.1.2 Real Network Experiments						13
	4.2	Results						13
		4.2.1 Controlled Network Results						13
		4.2.2 Real Network Results						13
5	Epil	ilogue						15
	5.1	Conclusion						15
		5.1.1 Comparison of the Extended GameMal	ker F	unct	iona	lity	with	
		Related Work						15
		5.1.2 Criticism on the Implementation and De	esign	Dec	ision	ıs .		15
	5.2	Future Improvements						15
Bi	bliog	graphy						17

#### **Background and Related Work**

nd

- 1.1.1 HTML5
- 1.1.2 NodeJS
- 1.1.3 GameMaker
- 1.1.4 Networks in Applications
- 1.1.5 TCP and UDP
- 1.1.6 Inter-application Communication

#### 1.2 Related Work

- 1.2.1 Unity
- 1.2.2 Unreal Engine 4
- 1.2.3 CryEngine
- 1.2.4 Havok Vision Engine
- 1.2.5 Project Anarchy
- 1.2.6 ShiVa
- 1.2.7 App Game Kit
- 1.2.8 GameSalad
- 1.2.9 ...

#### **Literature Review**

- 2.1 Multiplayer Networking in Modern Game Engines
- 2.2 Fairnesss and Playability in Online Multiplayer Games
- 2.3 ...

### **Development**

3.1	Des	ia	n

- 3.1.1 Prior Considerations
- 3.1.2 Server and Client
- 3.1.2.1 Good Coding Practices
- 3.1.2.2 Interaction

#### 3.2 Implementation

- 3.2.1 Server
- 3.2.2 **Client**
- 3.2.3 The Extension

#### 3.3 Applications Developed with the Extension

- 3.3.1 Benchmark Application
- 3.3.2 Real Game Application
- 3.3.3 Developer Template

#### **Network Extension Evaluation**

- 4.1 Setup
- 4.1.1 Controlled Network Experiments
- 4.1.2 Real Network Experiments
- 4.2 Results
- 4.2.1 Controlled Network Results
- 4.2.1.1 Concurrent Connections
- 4.2.1.2 Message Broadcasting Performance
- 4.2.2 Real Network Results
- 4.2.2.1 Location-wise Delay Fairness

#### **Conclusion and Future Work**

- 5.1 Conclusion
- 5.1.1 Comparison of the Extended GameMaker Functionality with Related Work
- 5.1.2 Criticism on the Implementation and Design Decisions
- 5.2 Future Improvements

# **Bibliography**

- [1] Hiroki Arimura. Learning acyclic first-order horn sentences from entailment. In *Proc. of the 8th Intl. Conf. on Algorithmic Learning Theory, ALT* '97, pages 432–445, 1997.
- [2] Chen-Chung Chang and H. Jerome Keisler. *Model Theory*. North-Holland, third edition, 1990.