The JominiEngine: a game engine for history education

Hans-Wolfgang Loidl[1] **Sandy Louchart**[2] **Robin Sloan**[3]

[1]School of Mathematical and Computer Sciences,
Heriot-Watt University, Edinburgh

[2]Digital Design Studio
Glasgow School of Art

[3]School of Arts, Media & Computer Games
Abertay University, Dundee

History & Games Workshop
Glasgow School of Art, Sep 29, 2016

sicsa* The Scottish Informatics & Computer Science Alliance

HERIOT WATT UNIVERSITY

Historical Games are Fun!

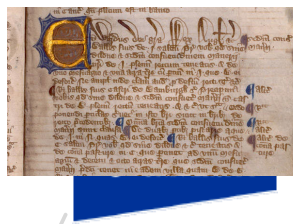
[0]from http://www.ckiiwiki.com/Crusader_Kings_II_Wiki

So Should be Learning about History!

[0]From http://www.communitycare.co.uk/; Pic: Source/Rex Features

"Interactive History"

- **Our *vision* is to develop a platform for "*Interactive History*" as a MMORPG where students/players can interact and learn about history**
- Goal: provide a *"story-living experience"* platform
- We want to improve student engagement and interaction
- To this end, we are developing a Serious Game Engine: the *JominiEngine*[1]
- Initially instantiated for the history period of 1194–1214 ("Magna Carta")
- Can be instantiated for several learning domains



[1] http://www.macs.hw.ac.uk/~hwloidl/Projects/JominiEngine/

"Interactive History"

- Our *vision* is to develop a platform for "*Interactive History*" as a MMORPG where students/players can interact and learn about history
- Goal: provide a *"story-living experience"* platform
- We want to improve student engagement and interaction
- To this end, we are developing a Serious Game Engine: the *JominiEngine*[1]
- Initially instantiated for the history period of 1194–1214 ("Magna Carta")
- Can be instantiated for several learning domains

[1] http://www.macs.hw.ac.uk/~hwloidl/Projects/JominiEngine/

"Interactive History"

- Our *vision* is to develop a platform for "*Interactive History*" as a MMORPG where students/players can interact and learn about history
- Goal: provide a *"story-living experience"* platform
- We want to improve student engagement and interaction
- To this end, we are developing a Serious Game Engine: the *JominiEngine*[1]
- Initially instantiated for the history period of 1194–1214 ("Magna Carta")
- Can be instantiated for several learning domains

[1] http://www.macs.hw.ac.uk/~hwloidl/Projects/JominiEngine/

"Interactive History"

- Our *vision* is to develop a platform for "*Interactive History*" as a MMORPG where students/players can interact and learn about history
- Goal: provide a *"story-living experience"* platform
- We want to improve student engagement and interaction
- To this end, we are developing a Serious Game Engine: the *JominiEngine*[1]
- Initially instantiated for the history period of 1194–1214 ("Magna Carta")
- Can be instantiated for several learning domains

[1] http://www.macs.hw.ac.uk/~hwloidl/Projects/JominiEngine/

"Interactive History"

- Our *vision* is to develop a platform for "*Interactive History*" as a MMORPG where students/players can interact and learn about history
- Goal: provide a *"story-living experience"* platform
- We want to improve student engagement and interaction
- To this end, we are developing a Serious Game Engine: the *JominiEngine*[1]
- Initially instantiated for the history period of 1194–1214 ("Magna Carta")
- Can be instantiated for several learning domains

[1] http://www.macs.hw.ac.uk/~hwloidl/Projects/JominiEngine/

"Interactive History"

- Our *vision* is to develop a platform for "*Interactive History*" as a MMORPG where students/players can interact and learn about history
- Goal: provide a *"story-living experience"* platform
- We want to improve student engagement and interaction
- To this end, we are developing a Serious Game Engine: the *JominiEngine*[1]
- Initially instantiated for the history period of 1194–1214 ("Magna Carta")
- Can be instantiated for several learning domains

[1] http://www.macs.hw.ac.uk/~hwloidl/Projects/JominiEngine/

A Shared Vision of Interactive History

Thus, it can be argued that *digital games allow for a different type of historical understanding.* This is an understanding not simply based on facts and figures, but rather on an understanding of process. It puts the player in the position of a historical agent and asks "*given the circumstances, what would you do?*" It is this *ability to offer a choice and investigate the consequences* that sets games media apart from traditional historical practice.

[1] From: Play the Past `http://www.playthepast.org/` by Matthew Kirschenbaum

Potential Learning Objectives

Cater for a wide range of *Learning Objectives*:

- **Learn about the *historical context*, about social and economic issues.**
- **Explore what-if scenarios, based on a precise historical model.**
- **Provide a platform for "war-game" style scenarios.**
- Improved student engagement.
- Improved *communication skills*, acquired in a non-intimitating environment.
- Increased awareness of social, cultural context.
- Incentive to learn about underlying *technologies* in this virtual world.

Potential Learning Objectives

Cater for a wide range of *Learning Objectives*:

- **Learn about the *historical context*, about social and economic issues.**
- **Explore what-if scenarios, based on a precise historical model.**
- **Provide a platform for "war-game" style scenarios.**
- **Improved student engagement.**
- **Improved *communication skills*, acquired in a non-intimitating environment.**
- **Increased awareness of social, cultural context.**
- **Incentive to learn about underlying *technologies* in this virtual world.**

Potential Learning Objectives

Cater for a wide range of *Learning Objectives*:

- Learn about the *historical context*, about social and economic issues.
- Explore what-if scenarios, based on a precise historical model.
- Provide a platform for "war-game" style scenarios.
- Improved student engagement.
- Improved *communication skills*, acquired in a non-intimitating environment.
- Increased awareness of social, cultural context.
- Incentive to learn about underlying *technologies* in this virtual world.

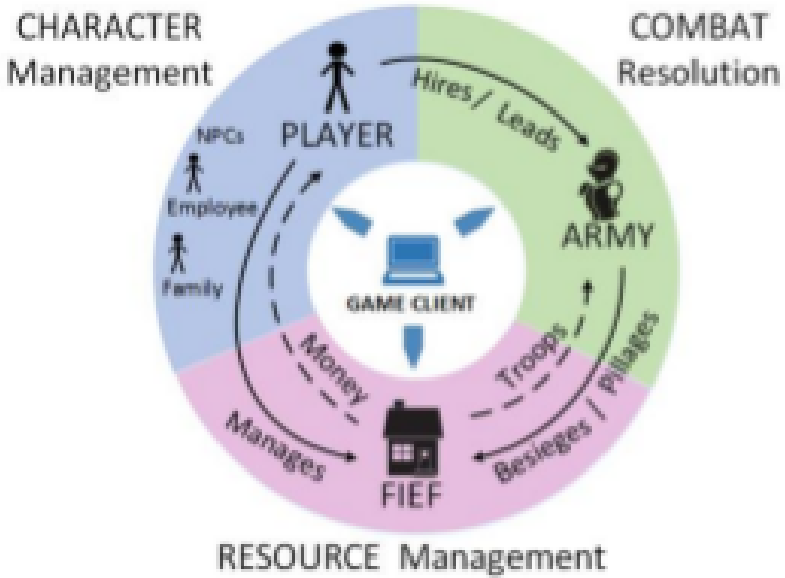
JominiEngine: Design Principles

JominiEngine design principles:

- ***accuracy*** **in the historic model to provide educational value**
- ***flexibility*** **in the content modelling to cover a range of periods**
- ***cooperative team-play embedded in a competitive game***
- ***security*** **in the interaction with the game engine**

Structure of the JominiEngine

The game engine is structured into 3 main components:



Further Development

- Improvements to the GUI front-end of the client (Unity-based).
- Integration of social networking functionality into the RPG context.
- Enhancing the current components of conflict, fief, and family management.
- Complementing the macro-history view with micro-history aspects ("zooming into fiefs").
- Implementing NPCs with AI functionality.
- Improvements to the security of the client-server implementation.
- Technical extensions: data-base distribution, fault tolerance, etc

Most of all: content authoring and embedding an instance of the JominiEngine into a *history curriculum.*

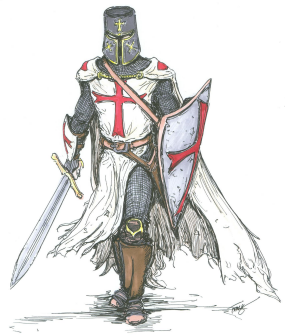
Further Development

- Improvements to the GUI front-end of the client (Unity-based).
- Integration of social networking functionality into the RPG context.
- Enhancing the current components of conflict, fief, and family management.
- Complementing the macro-history view with micro-history aspects ("zooming into fiefs").
- Implementing NPCs with AI functionality.
- Improvements to the security of the client-server implementation.
- Technical extensions: data-base distribution, fault tolerance, etc

Most of all: content authoring and embedding an instance of the JominiEngine into a *history curriculum.*

Summary

- **Games are a great way to engage students.**
- The *JominiEngine* should become a platform for *Interactive History*.
- We have a prototype with an instantiation for Britain in 1194–1214.
- We plan to deploy the JominiEngine as an educational tool in teaching history.

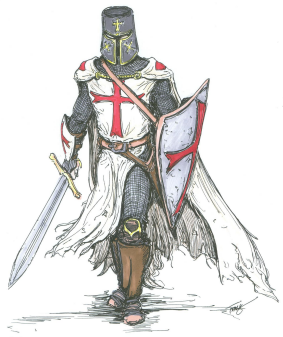


We hope that the JominiEngine can become the *motherboard* for developments in historical MMORPGs. *Join the fun!*

[1] Short link: `bit.ly/JominiEngine`

Summary

- **Games are a great way to engage students.**
- **The *JominiEngine* should become a platform for *Interactive History*.**
- We have a prototype with an instantiation for Britain in 1194–1214.
- We plan to deploy the JominiEngine as an educational tool in teaching history.

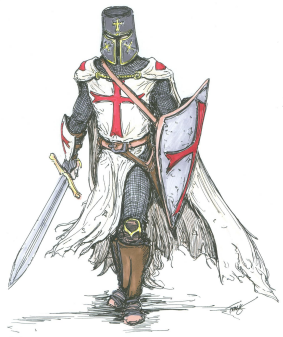


We hope that the JominiEngine can become the *motherboard* for developments in historical MMORPGs. *Join the fun!*

[1] Short link: `bit.ly/JominiEngine`

Summary

- **Games are a great way to engage students.**
- **The *JominiEngine* should become a platform for *Interactive History*.**
- **We have a prototype with an instantiation for Britain in 1194–1214.**
- **We plan to deploy the JominiEngine as an educational tool in teaching history.**



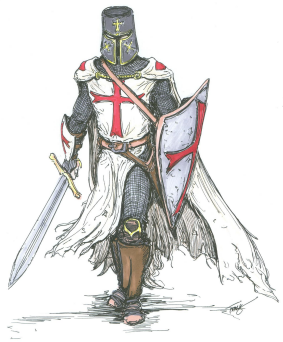
We hope that the JominiEngine can become the *motherboard* for developments in historical MMORPGs. *Join the fun!*

HERIOT WATT UNIVERSITY

[1] Short link: `bit.ly/JominiEngine`

Summary

- Games are a great way to engage students.
- The *JominiEngine* should become a platform for *Interactive History*.
- We have a prototype with an instantiation for Britain in 1194–1214.
- We plan to deploy the JominiEngine as an educational tool in teaching history.

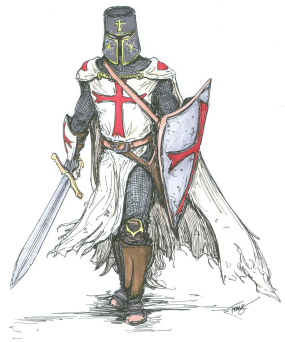


We hope that the JominiEngine can become the *motherboard* for developments in historical MMORPGs. *Join the fun!*

[1] Short link: `bit.ly/JominiEngine`

Summary

- Games are a great way to engage students.
- The *JominiEngine* should become a platform for *Interactive History*.
- We have a prototype with an instantiation for Britain in 1194–1214.
- We plan to deploy the JominiEngine as an educational tool in teaching history.



We hope that the JominiEngine can become the *motherboard* for developments in historical MMORPGs. *Join the fun!*

[1] Short link: `bit.ly/JominiEngine`

Implementation Issues

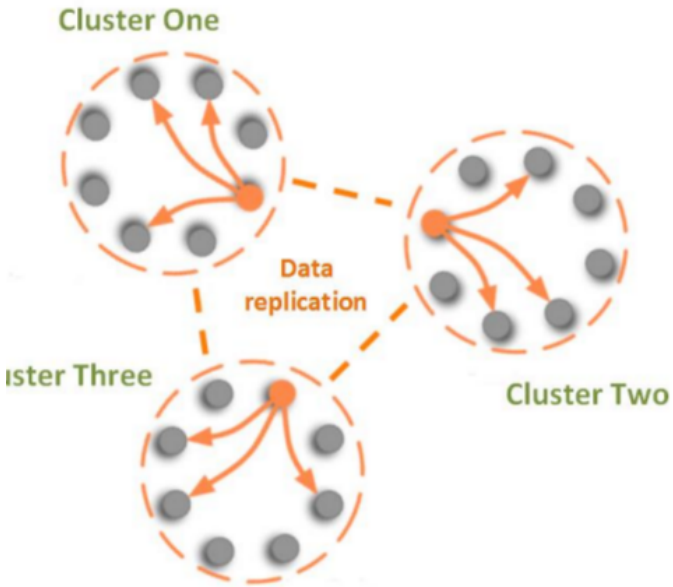
Notable aspects of the implementation are:

- based on a *client-server design*;
- implemented in *C#* to ease inter-operability
- the separation into components with clear interfaces (*modularity*);
- the use of a *noSQL database (Riak)* to store the game data;
- OpenSource

Implementation Issues

Notable aspects of the implementation are:

- based on a *client-server design*;
- implemented in *C#* to ease inter-operability
- the separation into components with clear interfaces (*modularity*);
- the use of a *noSQL database (Riak)* to store the game data;
- OpenSource



Implementation Issues

Notable aspects of the implementation are:

- based on a *client-server design*;
- implemented in *C#* to ease inter-operability
- the separation into components with clear interfaces (*modularity*);
- the use of a *noSQL database (Riak)* to store the game data;
- OpenSource

The JominiEngine serves not only as a vehicle for teaching in the domain of history, it also serves as an *object of study* in the domain of computer science (complex system engineering).

References

- Matthew Kirschenbaum *"War. What is it Good for? Learning from Wargaming"*. Blog on Play the Past. http://www.playthepast.org/?p=1819.
- "Why Wargaming Works", Peter Perla and ED McGrady (pdf)
- "The two cultures and the scientific revolution", C.P. Snow
- "Morphological study of the Video Games", J. Alvarez et al. (pdf)