**Maces and Talons**

Final Report for CS39440 Major Project

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**Acknowledgements**

I am grateful to…

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**Abstract**

This aim of this project was to produce a video game representation of the medieval Scandinavian board game Hnefatafl, providing single device and online multiplayer support.

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# Background, Analysis & Process

## Background

The Project aims to create a video game based on the Scandinavian medieval board game ‘Hnefatafl’, this game would feature a single device two player hot seat mode and an online multiplayer mode.

Having previously developed two Android applications and several years of experience developing in Unity 3D, this project idea was interesting to me because I could use skills that I had learnt at University and skills developed in my spare time to produce my best game so far.

‘Hnefatafl’ is a variant of the larger game ‘Tafl’, Tafl is a board game in which two forces much like chess compete against each other to win, unlike chess the two sides are uneven and have different win conditions. As the board game moved around northern Europe different rulesets were developed and layouts to the board and pieces [5], ‘Hnefatafl’ which is the Scandinavian variety uses a board which is 11 squares by 11 squares (11x11) or less commonly 13x13, there are other known types such as ‘Ard-Ri’ and ‘Tawlbyund’ which use 7x7 and 11x11 respectively.

The two different board sizes for Hnefatafl also presents two different configurations for the pieces as shown in Fig 1, while the outside ‘Barbarian’ pieces remains the same the Vikings in the centre have a slightly different formation.

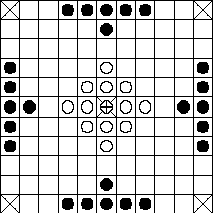
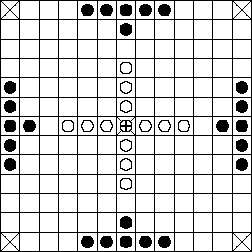
 

Fig 1. [5] The two sizes of Hnefatafl board with the pieces arranged accordingly.

Due to time restrictions the Project just focuses on the more commonly used board size 11x11 and the corresponding piece layout, however there is the option to add the other size if time permits.

The rules of Hnefatafl are a lot simpler than those of chess, all pieces move in the same manner, in straight lines horizontally and vertically as far as they want until hitting an obstruction. This is much the same as a rook in chess except that you do not take a piece by going on to its space, pieces in Hnefatafl cannot pass through or go on to space occupied by another space, this allows for strategies that rely on blocking the opposing team off. To take a piece it must have two opposing pieces on two opposite sides, therefore creating a line of three, the taken piece is removed from the game. The one unique piece is the ‘King’ this is placed in the center of the board and is surrounded by the ‘Knights’ or in the case of ‘Hnefatafl’ the ‘Vikings’, to take/capture the King it must be surrounded on all four sides by opposing pieces or edges of the game board. Fig 2 shows the different cases when the King could be taken, the difficulty of taking the King is made easier by the uneven numbers, the ‘Barbarians’ have almost double the number of pieces at 24 versus the ‘Viking’s’ 13.

http://www.gamecabinet.com/images/Hnef/Image10.gifhttp://www.gamecabinet.com/images/Hnef/Image11.gif http://www.gamecabinet.com/images/Hnef/Image12.gif http://www.gamecabinet.com/images/Hnef/Image13.gif

Fig 2. [5] All cases in which the King would be taken.

The objectives of both teams are different, the ‘Barbarian’s’ sole goal is to capture the King, theoretically this also could lead to them capturing all of the other Viking pieces but this is not necessary for them to win. The ‘Vikings’ must get their King to one of the 4 corners of the board to win, or capture all of the opposing ‘Barbarians’ but this is highly unlikely due to the imbalance in the two sides, this outcome would only happen if the person controlling the ‘Barbarians’ is very inexperienced.

### Similar Systems

There are several Android applications that are published on the ‘Google Play Store’ and emulate ‘Hnefatafl’, they provide features that I aim to produce and this allows me to analyse them and see what works well and if anything can be improved.

The first application I looked at was called ‘Hnefatafl’ [1] this game provides a lot more than the project aims to deliver in the time frame,

Tafl uses tafl rules not Hnefatafl

### Development Research

## Analysis

## Process

# Design

## Overall Architecture

## Detailed Design

### Even More Detail

## User Interface Design

## Other Relevant Sections

# Implementation

# Testing

## Overall Approach to Testing

## Automated Testing

### Unit Tests

### User Interface Testing

### Stress Testing

### Other Types of Testing

## Integration Testing

## User Testing

# Critical Evaluation

# Appendices

* 1. Third-Party Code and Libraries

**MK Glow Unity Asset \*Free** – This asset provides some fancy glowing materials which I am using for selected pieces in the game. [1]

* 1. Ethics Submission
  2. Code Samples

# Annotated Bibliography

[1] MK Glow Free - <https://assetstore.unity.com/packages/vfx/shaders/fullscreen-camera-effects/mk-glow-free-28044>

This Unity asset provides some fancy glowing materials.

[2] Hnefatafl (Philippe Schober) (Google Play Store) –

<https://play.google.com/store/apps/details?id=com.fellhuhn.hnefatafl>

[3] Tafl (Jocly) (Google Play Store) –

<https://play.google.com/store/apps/details?id=com.jocly.android.app10_vc_as>

[4] Hnefatafl (MeatballsTeam) (Google Play Store) –

<https://play.google.com/store/apps/details?id=com.meatballsteam.hnefatafl>

[5] Hnefatafl The Viking Game - <http://www.gamecabinet.com/history/Hnef.html>

[6] Hnefatafl - <https://boardgamegeek.com/boardgame/2932/hnefatafl>

[7] The History of Hnefatafl - <http://tafl.cyningstan.com/page/3/the-history-of-hnefatafl>